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THE MAGAZINE OF TODAY'S MOTIVE POWER

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THE MAGAZINE OF TODAY'S MOTIVE POWER

LOCOMOTIVE FEATURES

On the Cover

Hot out of Altoona, Pa., on the old Pennsy Broad Way, tuxedo-painted Norfolk Southern F9A No. 4270 leads NS office car special 955 around Horseshoe Curve, bound for Louisville and the Kentucky Derby on April 25, 2007. *Greg McDonnell*

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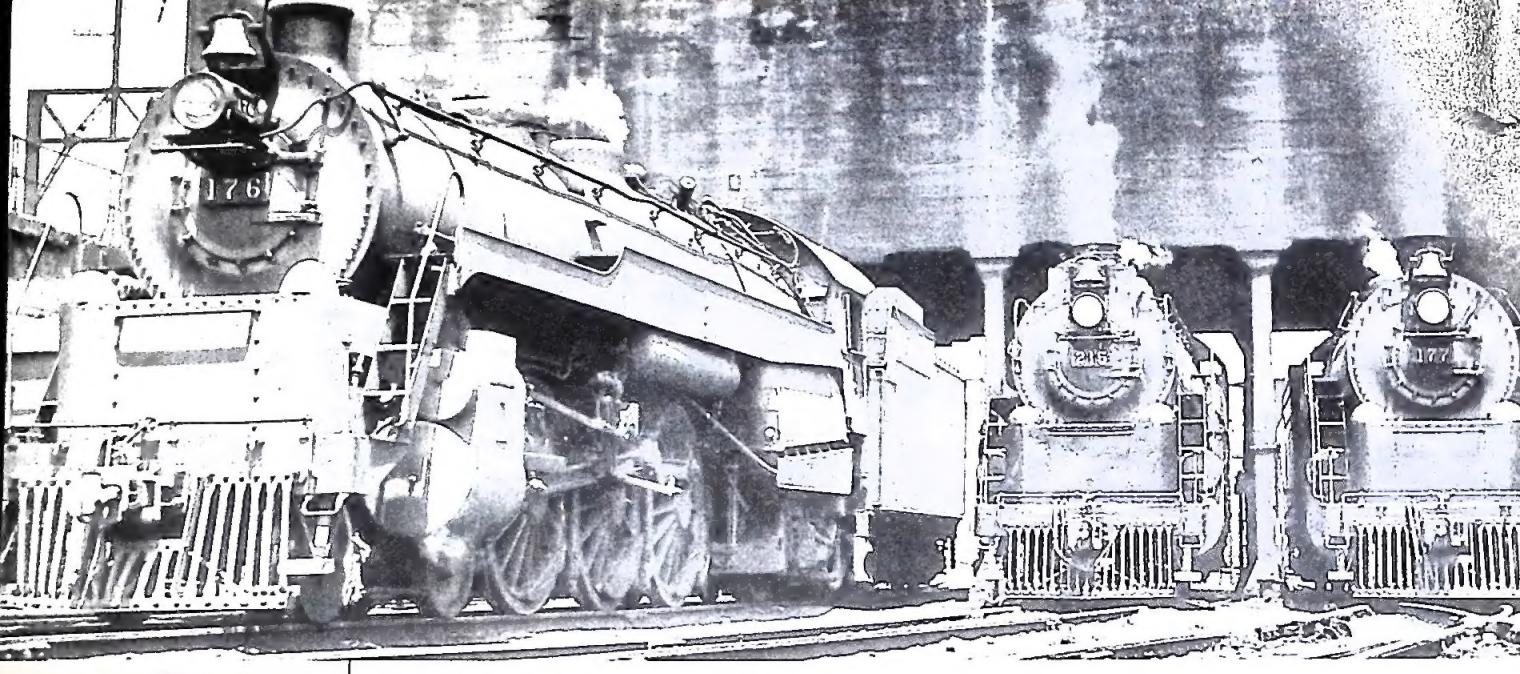

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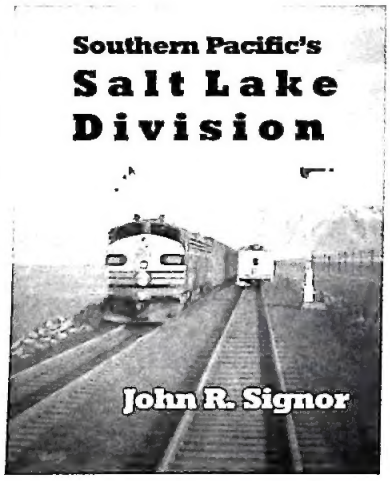

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Trains

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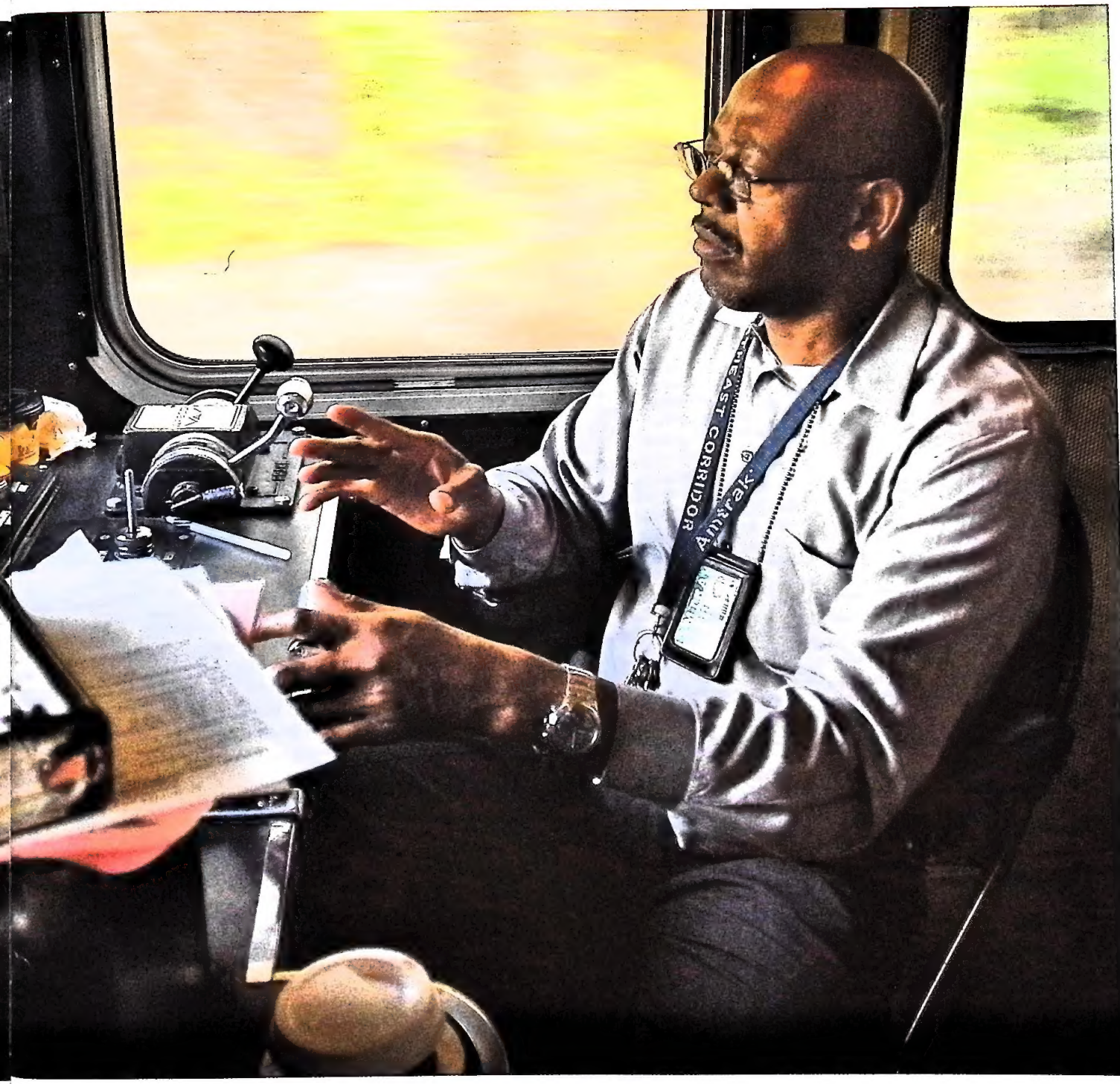
The Human Touch

Photos by Greg McDonnell

It's no secret. This magazine is about locomotives. Less obviously, no less importantly though, it is also about people; the people who design and build and operate and maintain the fascinating machines that first drew most of us trackside ... and keep calling us back. Dozens of railroaders have been directly involved with the content of this issue, from crane operator Julian Jackson, who provided a bird's eye view of Amtrak's Wilmington, Del., locomotive shop, to general superintendent Lynn Ramsey, who put out the welcome mat at Norfolk Southern's Juniata Shop; people like Amtrak locomotive engineer Leonard Robinson who, with the digital speedometer of AEM7 947 pegged at 125 mph, made masterful train-handling look easy ... when it's anything but; people like Union Pacific's General Director of Car and Locomotive Engineering, Mike Iden, the man behind the genset locomotive concept; and people like Darnell Wood, Rudy Husband and Todd Treaster; Andrew Fox, Tom Kissel, Mike Acker, Bob Watson, Mario Bergeron, and Tom Harley. It's no coincidence, either, that more than a few of the authors and photographers whose work appears on these pages are, or have been, railroaders.

From 50-year-old Fs fighting snow and heading up trains of polished Tuscan heavyweights, to AEM7s knocking off Northeast Corridor miles at two-per-minute, to genset switchers taking on their first assignments, the locomotives that occupy these pages really are mean, captivating machines, but it's the human touch that makes it real. And makes it matter.

Greg McDonnell
Editor



Railroaders bring their magnificent machines to life. At the throttle of NS F9A 4270, locomotive engineer Todd Treaster (far left) departs Altoona, Pa., with the Masters' special. In the catbird seat at Amtrak's Wilmington, Del., shop, Julian Jackson (left) operates the overhead crane, while (above) Amtrak engineer Leonard Robinson cruises the Northeast Corridor near Midway, N.J., at 125 mph in the cab of AEM7 947.

LOCOMOTIVE 2007 MOTIVE POWER REVIEW

David Lustig

David Lustig

What's New in the Showroom

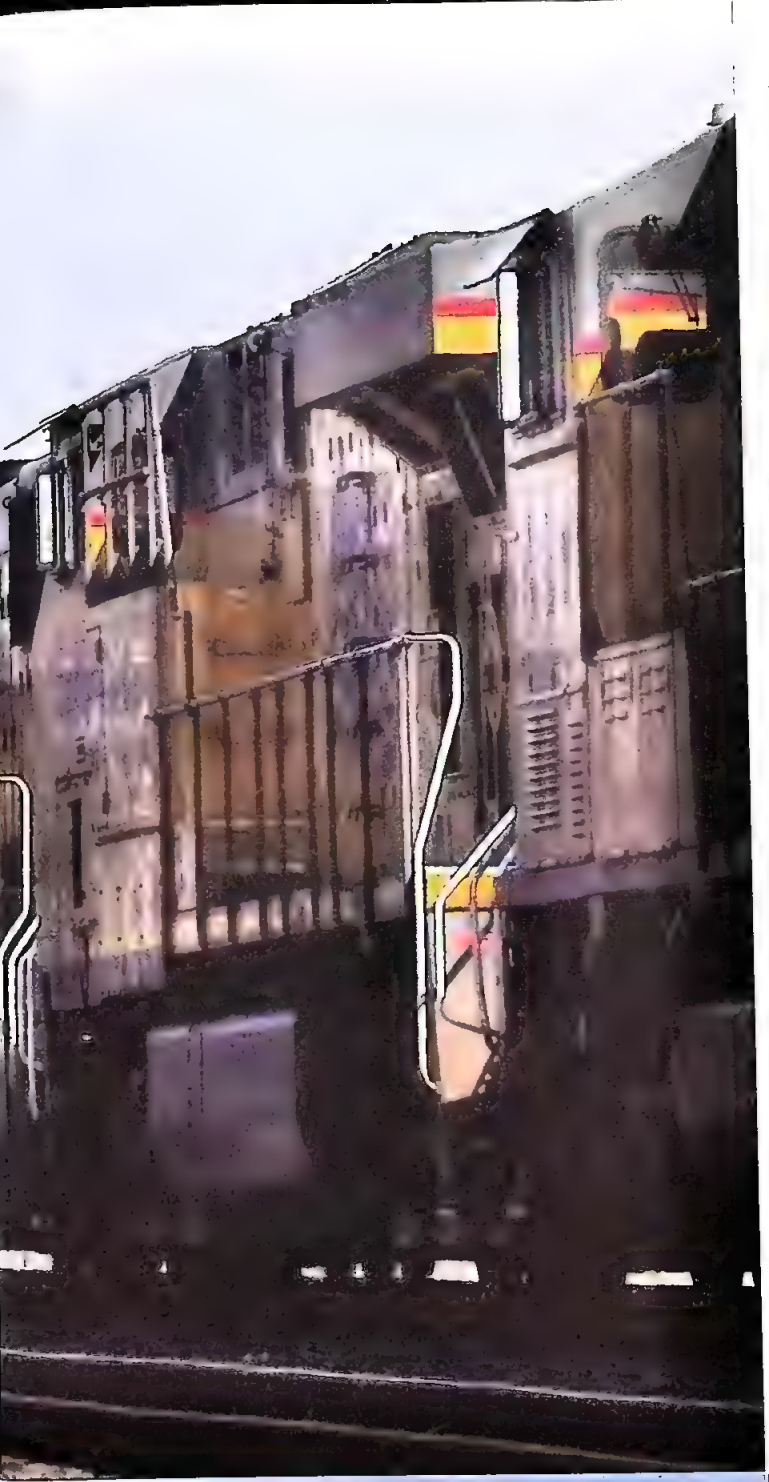
By David Lustig

For railroads, choosing a mainline diesel locomotive in 2007 can almost be compared to the statement made by industrialist Henry Ford about his Model T automobile in the early 20th century: "You can have it in any color as long as it's black."

It's not quite that extreme for today's railroad motive power, but the two dominant locomotive builders, General Electric and Electro-Motive Diesel, each offer but one locomotive type available in two different models. Do you want it with a direct current or alternating current drive?

As a train-watcher, that uniformity threatens to border on the monotonous, but to the railroad industry, this mega-standardization is one of the lynchpins keeping railroading, and locomotive building, economically sound. By offering just a few proven locomotive models, the builders are making good on an assurance that the freight carried by railroads will be delivered reliably and efficiently, at least as far as the motive power is concerned. Like it or not, railroading 50 or 60 years ago couldn't say that.

Variety does exist — but you may have to venture off the busy main lines. To meet the demands of commuter agencies, regional railroads, short lines, industrial operations, and even Class Is that don't want to use 4,000 horsepower to switch a few cars on a local freight, there are a number of excellent niche builders offering a right-size solution to almost anything the big boys can't fulfill. Here's a brief look at today's locomotive landscape and what's new in the showroom.



Still dressed in her special "Green Locomotive Technology Tour" colors, UP ES44AC No. 7605 leads a North Platte-Fresno drag past a hot Z-train at Covell, Calif., on May 31, 2007.

— Photo by Ted Benson

Bruce Jacobs

The first General Electric hybrid diesel-electric testbed, GE 2010 — modified from Evolution Series prototype 2005 — shows off at Los Angeles Union Station on May 24, 2007. The brightly painted testbed is the first step toward a true hybrid road locomotive.

General Electric

General Electric is the undisputed leader in U.S. locomotive production, having actively pursued a strategic plan to wrestle away that position from EMD — and achieving that aim in the mid-1980s. GE's goal was as bold as it was simple: When someone sees a mainline train go by, make sure it has one of its locomotives on the point.

GE currently catalogs two look-alike models, both of which are built at its Erie, Pa., facility: the ES44DC and the ES44AC. The "ES" stands for Evolution Series — GE's marketing name for its Tier Two compliant locomotive (meaning it meets current Environmental Protection Agency standards for emissions) equipped with a 4,400-hp prime mover. Evolution Series locomotives are available in direct current or alternating current models.

Since their introduction in 2003 with a batch of pre-production units for BNSF, more than 1,300 Evolution Series locomotives are riding the rails, adorned in the colors of almost every major railroad: Armour Yellow on Union Pacific, CSX blue and yellow, BNSF's Heritage paint scheme, the red hues of Canadian National and Canadian Pacific, and the basic black and white of Norfolk Southern. NS actually breaks away from uniformity by ordering units rated at 4,000 hp — classed as ES40DCs — and CSX receives a traction-enhanced version for heavy-haul operations on its Cranberry Grade in West Virginia.

The ES series has a host of features, anchored by a newly designed 4,400-hp, four-stroke GEVO 12-cylinder engine, producing 40 percent fewer emissions than previous models that used a 16-cylinder design. GE says its Evolution Series locomotive design produces 83 percent fewer particulates and reduces nitrogen oxide emissions 60 percent. Compared with units built in the late 1980s, today's models will also consume 189,000 fewer gallons of fuel in a lifetime. In addition, GE is

Dan Munson

Among the legions of Evolution Series locomotives dispatched from Erie over the past few years, freshly painted KCS ES44AC No. 4679 (above) poses with SD70ACe No. 3997 at Council Bluffs, Iowa, while BNSF ES44ACs No. 5822 and 6072 work eastbound coal train C-EBMRTR0-31A at Belmont, Neb., on Oct. 18, 2006.

claiming a 184-day running maintenance cycle over the usual 92-day span. Actual prices railroads pay for the units are confidential, but you could expect it to be just over $2 million a copy for an A.C. unit and $2 million for a D.C. model.

General Electric is not content to rest on its laurels, however, and the company is fervently pursuing technology that will harness the energy dissipated when a unit is braking and store it in a series of lead-free rechargeable batteries. When needed, the stored energy then can be used to create up to 2,000 hp for a short period of time.

Being developed as a "hybrid diesel-electric locomotive," the concept is to store that energy for use on demand — reducing fuel consumption and emissions as much as 10 percent compared with most of the locomotives used today.

After years of being more rumor than fact, a 207-ton hybrid test bed locomotive — built from the company's Evolution Series testbed No. 2005 — emerged in April of this year. Dressed brilliant shades of green and blue, and numbered GE 2010, the latest green machine ran in the consist of a short test train from its Erie birthplace to a media unveiling at Los Angeles Union Station, then back to Erie in May. The trip enabled company engineers to obtain real-time, over-the-road data. GE expects to have hybrid testbeds available for over-the-road testing in the next few years.

While the domestic lineup of diesel locomotives may seem fairly limited in scope, General Electric has maintained an aggressive staff for overseas sales, and foreign countries can purchase a variety of new "older" designs including the AC4400 and the Dash 9 series of D.C.-powered locomotives.

William D. Miller

Casey Thomason

Only a few weeks old, Florida East Coast SD70M-2s 100 and 101 lead Jacksonville-Miami train 101 onto the main line at Sunbeam, at the south end of Jacksonville's Bowden Yard, on Jan. 19, 2007.

Electro-Motive Diesel

Once the leader in North American diesel production, EMD, spun off in April 2005 from parent General Motors, is now holding a solid second place in the North American locomotive market. EMD's headquarters is in La Grange, Ill., a suburb of Chicago, and its primary assembly facility is in London, Ontario. During periods when locomotive orders outstrip London's limited capacity, EMD outsources assembly, often to Bombardier's facility in Sahagun, Mexico. Bombardier has assembled more than 1,100 EMD locomotives at Sahagun since 1998 and recently announced a contract for the assembly of 100 SD70ACe units at the Mexican facility in the second half of 2007.

EMD offers just two domestic off-the-shelf models: the two-cycle, Tier 2 compliant, 4,300-hp, six-axle SD70ACe, and its D.C. brother, the 4,300-hp SD70M-2. Both use EMD's 16-cylinder 710G3C-T2 engine.

Options such as seats, refrigerators, types of potties, air conditioning, and the like make up the rest of the difference between one railroad's order and another. The price for an EMD SD70 series unit is pretty much in the same ballpark as its GE counterpart.

EMD also has been a major worldwide player in diesel locomotive sales, and counts among its foreign models the Series 66 double-ended locomotives and the double-ended Euro 4000, new this year, producing 4,250 hp from the company's proven 710 engine. The Euro 4400 will be built by Vossloh Espana in Valencia, Spain.

Other exports have been modified SD70Ms for Brazil and SD70ACe orders for BHP Billiton Iron Ore in northwest Australia. The BHP units are classified SD70ACe/lc, the "lc" indicating they have been modified for "low clearance" to accommodate the loading and unloading equipment at the mine.

If there is a surprise in the overseas EMD catalog, it is the JT56ACE. Designed for the China Ministry of Railways, this double-ended, 6,000-hp design incorporates the four-stroke 265H engine, once considered the heart of the next-generation EMD engines. (It powers the no-longer-in-the-catalog SD90MAC for domestic consumption.) Although considered a "good" engine, the "H" series has been overshadowed by the 710 design. Though the "H" engine is not Tier 2 compliant, EMD engineers say it would not be hard to make it so for use in this country, but to date, there have been no domestic buyers.

When You Don't Buy New

Despite what appears to be a rather sterile future in motive power, there is still quite a variety of older, rebuilt, and niche power working today.

Locomotive rebuilders are capable of both remanufacturing and overhauling existing locomotives, whether they are wrecked, damaged, or just plain pooped.

Remanufacturing has the ability to increase performance and add 15 to 20 years to the life of the unit at a cost that generally rings in at about 60 percent of the price tag of a new locomotive.

In the remanufacturing process — which varies slightly from company to company — the unit is usually taken apart until there is nothing left but the frame. The frame is inspected for structural integrity, while other components are either reconditioned or replaced; some rebuildings may include the addition of components that were developed after the original unit was built (such as the installation of microprocessors to bring an older EMD locomotive up to so-called Dash 3 standards). On the outside, the exterior is sandblasted and repaired if neces-

Howard Ande

Union Pacific's seemingly insatiable desire for the D.C.-traction SD70M, and now the A.C.-traction SD70ACe, has kept food on Electro-Motive's table since the landmark 1,000-unit UP order that began delivering in 2000. Notch-nosed UP SD70ACe No. 8489 leads westbound stacks through LaFox, Ill., at sunset on Nov. 9, 2006.

sary. Finally, the newly rebuilt unit gets a coat of paint and some reflective decals.

Another option is a locomotive overhaul. An overhauled unit typically receives a thorough mechanical and electrical inspection and test, with any defective components or conditions repaired or replaced. The entire locomotive is cleaned; sometimes painted, sometimes not. As a rule, rebuilt units usually last fewer years than a remanufactured one.

That being the case, if it's motive power variety that you crave, all you have to do is scratch the surface just a little. Do so and you find locomotives from ....

MotivePower

MotivePower, a division of the Wabtec Corp., is not only a longtime rebuilder, but also a niche builder producing remanufactured freight locomotives and new commuter power. MP locomotives are now hauling commuters around North America on Chicago's Metra, Albuquerque's New Mexico Rail Runner Express, Vancouver, B.C.'s West Coast Express, and soon, Salt Lake City's Utah Transit Authority, Southern California's Metrolink, Minnesota's North Star, Boston's Massachusetts Bay Transportation Authority and Toronto's GO Transit.

MotivePower is an outgrowth of the original railroad division of Morrison-Knudsen of the 1970s. Spun off in 1994 as MK Rail, it was named MotivePower Industries, thanks to a company contest held for employees, with the Boise, Idaho, facility becoming Boise Locomotive. After more mergers, MP became a division of the Wabtec Corp.

Other new equipment in the company's history includes Massachusetts Bay Transportation Authority F40PH-2Cs, basically a copy of EMD's stretched F40 with a separate head-end power generator; the 5,000-hp MK5000C; and four LNG-burning MK1200Gs, two apiece delivered to the Santa Fe and the Union Pacific. All four eventually wound up on BNSF subsidiary Los Angeles Junction. For a while, EMD and MP entered into a joint marketing agreement for specific switcher models to be built by MP but marketed under the EMD label, including the GP15D and GP20D.

What made MP's stickpin stay on the map was an order for 27 3,600-hp MP36-3S commuter locomotives for Metra. Not only were the MP36s entirely new units, MP went head-to-head in the bidding process with EMD and GE ... and won! Starting in 2000, the units were designed and delivered in 22 months and, after several teething problems were brought under control, have become reliable and stable locomotives.

MotivePower's MPXpress line of commuter locomotives currently offers two models, the MP36, using an EMD-like 645 engine at 3,600 hp, and the just-announced MP40, powered by EMD's 710 engine rated at 4,000 hp. (There are also

A. Ross Harrison

Builder's plate, GO Transit MP40PH-3C No. 601.

First in line for MotivePower's new MP40PH-3C is Ontario's GO Transit. The Greater Toronto Area commuter agency has ordered 27 MP40s, with delivery scheduled to begin in September 2001. GO 601 (above) poses for the company photographer at MotivePower's Boise, Idaho, shop. On the freight side, the MP catalog includes four- and six-axle versions of the 2000-hp MP20. UPY 2109 (below) illustrates the four-axle model, designated MP20B-3. All of UP's Texas-assigned MP20B-3s, remanufactured from retired GP50s, are powered by optional Tier 2 compliant Caterpillar 3516C diesels.

Tom Kline

options for source of the head-end power. The suffix "C" indicates a separate diesel head-end power plant, while "S" at the end of the model indicates a static inverter). The first MP40s are about to be delivered to GO Transit, with an order for 27 units and an option for 26 more. MP has submitted a bid to MBTA for the same locomotive. There are 100 MPXpress locomotives at work or on order for eight transit agencies operating commuter trains in North America.

Other models in the MP catalog include the MP20B-3 (MotivePower, 2,000 hp, four-axle trucks, Dash 3 microprocessor controls), remanufactured from GP50 cores. The first examples were delivered to Union Pacific in 2007 and more will go to Pacific Harbor Line, working the side-by-side ports of Los Angeles and Long Beach in Calif. MP also offers the six-axle MP20C-3, 16 of which have already been sold to PHL.

While the MP20C-3 may look like an EMD SD40 from the 1960s, the locomotive is all-new from the frame up. The model uses reconditioned SD40 and SD45 frames and rebuilt EMD trucks and traction motors — everything else is new, including the cab and hoods, engine, electronics and machinery. PHL was the first carrier to order this new model, offering further proof that MotivePower understands that, in order to be successful in the niche locomotive market, it must have as part of its standard operating procedure the ability to fulfill specific customer requirements. For example, depending on the locomotive model, MP can offer its railroad customers a choice of various engine manufacturers. The Pacific Harbor

David Lustig

Brand-new from Boise, Pacific Harbor Line's MP20C-3 Nos. 60, 61 and 62 meet on the PHL shop leads at Wilmington, Calif. Serving the side-by-side ports of Los Angeles and Long Beach, PHL plans to replace its entire fleet of aging EMDs, from former-Conrail SW1200s and used Geeps, to a stable of hand-me-down SDs of Baltimore & Ohio, Chicago & North Western, Southern, and Union Pacific heritage, with low-emissions locomotives. Most of the new units will come from Boise, with MotivePower supplying 16 six-axle MP20C-3s and three four-axle MP20B-3s. All will be powered by 12-cylinder, 2,350-bhp engines from MTU-Detroit Diesel. Among the units to be replaced is PHL 2026, an ICG-Paducah SD20 that began life as EMD SD24 demonstrator No. 5579.

David Lustig

Line units are equipped with a 12-cylinder power plant from MTU-Detroit Diesel, formed in the 2005 merger of MTU Friedrichshafen GmbH of Germany and U.S.-based Detroit Diesel Corp. MotivePower will, according to customer preference and specifications, outfit the MP20 with either Cummins or Caterpillar engines. Both options are Tier 2-compliant.

The next model MotivePower hopes to release is its version of the multiple-engine genset switcher. MP's initial offering is intended to be a three-genset, four-axle model designated MP21B. A two-engine model, the MP15B, will follow. Both versions are expected to be available by the end of 2007.

In addition to the production of new and remanufactured locomotives, MotivePower continues to actively bid on its old stock and trade: rebuild work. MP management says the Boise shop will handle almost anything on rails, including modernization and upgrade programs for contemporary EMD and GE locomotives.

Jim Shaughnessy

RailPower

Perhaps the instigator of the current hybrid diesel phenomenon, RailPower, a Canadian company with U.S. headquarters in Erie, Pa., made its mark at the beginning of the 21st century with its GG20B Green Goat, a 2,000-hp switcher using a large bank of maintenance-free, lead-acid batteries located under its low long hood to power the unit's traction motors. A small on-board, 300-hp genset ensures the batteries maintain their full charge when the unit is not batting around cars.

Green Goats, and their less powerful sibling Green Kids, are remanufactured from retired locomotives, typically using rebuilt frames and trucks from EMD GP9s and GE B23-7s, although any platform can be used. Everything above the frame of the core unit is stripped away and replaced with new equipment, cab, and carbody.

Orders for Green Goats got a shot in the arm when individual states, notably California and Texas, offered to partner with railroads to fund the purchase of new environmentally friendlier units in order to help clear polluted air from their big cities. The states leveraged their financing with a provision that, for every hybrid Goat put in service, a traditional "straight-diesel" locomotive would be removed.

Green Goats can be found on BNSF, Union Pacific, Canadian Pacific, Kansas City Southern, Norfolk Southern,

Currently without an assembly facility of its own, RailPower contracts other shops to construct to its locomotives. Much of the work has been done by Super Steel Schenectady in Scotia, N.Y., including all but 15 of the 98 RP20BDs for Union Pacific. Super Steel-built UPY 2623 rests outside the New York facility on Dec. 20, 2006. The last 15 units of the UP order, including UPY 2690 (below), are being built by CAD Railway Services in Lachine, Que.

Greg McDonnell

Both photos Blair Kooistra

Lead by UPY 2635, a half-dozen Union Pacific RP20BDs (left) pass the University Avenue control point with a transfer move from Ney Yard to Davidson Yard in Fort Worth, Texas, on June 2, 2007. At right, a quartet of new RP20BDs cast their reflection as they prepare to work a Fort Worth transfer on May 12, 2007.

Railserve, Amtrak, and a handful of U.S. Army bases. There have been electrical teething problems with a number of Green Goats and, in June, the company recalled 59 of them for retrofits and upgrades intended to resolve these issues.

While Green Goats established RailPower as a niche player in the locomotive market — and the company is still committed to the Goat concept — it was RailPower's willingness to dive into the diesel genset arena that has proved extremely popular.

The genset concept, while not exactly new technology, is considered an excellent way of reducing emissions from locomotives that we have assignments requiring them to spend much of their on-duty time at low-speed or idling in heavily polluted areas such as Houston, Texas, and almost anywhere in metropolitan Southern California.

A series of completely independent diesel-generator "platforms" (the genset) is arranged elephant style inside the long hood (replacing the one large diesel engine usually found there idling endlessly). The most popular locomotive arrangement today is a three-genset design. Only one genset actually operates when the unit is idling, while the other sets are shut down in standby mode. Additional gensets come on-and off-line as required during operations. Use of individual gensets on the locomotive is automatically rotated to even out wear. Units can also be programmed to shut down periodically, then restarted with the proper electrical command to ensure all fluids stay at proper operating temperatures.

Currently, RailPower is offering its Green Goats and Green Kids, and a family of multi-genset yard and road switchers ranging from four-axle units delivering 1,400 hp to six axles delivering 2,700 hp.

Blair Kooistra

National Railway Equipment

Headquartered in Mount Vernon, Ill., the National Railway Equipment Co., is one of the world's largest suppliers of remanufactured locomotives, rebuilt mechanical materials, electrical systems and components, locomotive field service, and technical support. It recently stepped into the genset business with a prototype two-genset unit for Union Pacific and production model two- and three-genset versions, primarily for UP, BNSF, and to date, a few short lines.

Fort Worth & Western's NRE gensets, 2GS-14B Nos. 2014 and 2013, rest in the yard at Everman Industrial Park, on Fort Worth's south side on June 13, 2007. While most NRE gensets are constructed on new platforms, the FWWR pair uses reconditioned frames of retired EMD Geeps. In common with most Texas-based low emissions locomotives, FWWR's genset purchases were partially funded by a grant from TCEQ, the Texas Commission on Environmental Quality. Union Pacific's 60 NRE 3GS-21Bs are assigned to Southern California. Class engine, UPY 2701 (below) rests in the yard at Commerce on Jan. 30, 2007.

RELCO

The name RELCO dates back to 1961 when George Bachman began leasing locomotives to railroads and industrials throughout the Midwest from its headquarters in Joliet, Ill. In 2007, RELCO Locomotives Inc. now leases, sells, rebuilds, and remanufactures entire locomotives.

Headquartered in Minooka, Ill., RELCO opened up a second rebuild and service facility in April 2005 on a 95-acre site in Albia, Iowa — about 66 miles southeast of Des Moines — to complement its smaller facility in Illinois. The main locomotive shop at the new facility is 90,000 square feet, has five tracks, and is equipped with six overhead cranes.

As with the other locomotive rebuilders, RELCO is capable of completely disassembling a locomotive, inspecting all components and restoring them to original specifications or replacing them, while also incorporating technological improvements and upgrades introduced since that particular locomotive was built. RELCO provides complete documentation of the process, including major systems schematics, diagrams, repair guides, and operating manuals.

CEECO

Coast Engine and Equipment Co. (CEECO) of Tacoma, Wash., operates a well established locomotive- and car-rebuilding shop in the Pacific Northwest.

As with the other companies, CEECO prides itself on being equipped to handle any assignment from requests for minor field service to complete remanufacturing.

CEECO is an authorized EMD warranty and repair facility for the West Coast, and it is not unusual for a newly built, primer-painted diesel to be shipped there from London, Ont., to receive a final inspection and then emerge from its paint shop in the customer's color scheme.

The CEECO diesel engine shop is capable of rebuilding any EMD 567, 645, 710, and 265H engine, as well as the 6,000-hp General Electric 7HDL-16 originally developed for the AC6000W. 1

David Ludig

Wes Corr

UPY 2709 keeps company with GG20B Green Goat 2312 (above) at West Colton, Calif., on May 30, 2007. Gensets have grabbed the limelight of late, but UP remains committed to Green Goats, as well. In Texas (right), one of two Dallas, Garland & Northeastern 2GS-14B gensets, DGNO 141, works east of Carrollton on June 1, 2007.

A privately owned network of manufacturing sites spread throughout the North American continent, NRE is the result of the gradual consolidation of a number of firms since 1984. Today, it has 10 facilities encompassing more than 275 acres with more than 1.3 million square feet under roof.

NRE estimates it has more than 500 locomotives for sale or lease at any one time, ranging from SD40-2s and SW1500s to a variety of GE switchers and road-switchers, as well as supply parts for Alcos, GEs, and EMDs.

VMV Paducahbilt was purchased by NRE as a wholly owned subsidiary in June 2002. Located in Paducah, Ky., VMV occupies the former Illinois Central locomotive shops with more than 450,000 square feet of capacity located on a 114-acre site.

Green Machines

Blair Kooistra

Gensets get to work

By Greg McDonnell

Union Pacific RP20BD gensets UPY 2617, 2643 and 2641 cross the Trinity River bridge on the north side of Fort Worth, Texas, returning to Ney Yard with a local turn to Saginaw on June 2, 2007. All 98 of UP's RailPower gensets are assigned to yard and local service in Texas.

Last year at this time, the genset locomotive was little more than a solitary prototype and a twinkle in the eye of Union Pacific General Director of Car and Locomotive Mike Iden. Today, Union Pacific has 159 genset locomotives from two builders in service or on delivery — 61 National Railway Equipment-built units assigned to the L.A. Basin in Southern California, and 98 RailPower Technologies RP20BDs for duty in Texas — plus more on order, including new six-axle models for California hump service. What's more, the concept has caught on nationwide: BNSF has 14 NRE gensets at work in Texas and 25 more being delivered; Norfolk Southern has joined the party with two Juniata-built, RailPower-design units in service, two more abuilding and more on order from both builders; Texas regionals Dallas, Garland & Northeastern and Fort Worth & Western each have a pair of NRE units and builders NRE and RailPower have demonstrators on tour and orders for dozens of genset locomotives on the books. Meanwhile, Wabtec's MotivePower Industries is preparing to market its own line of genset locomotives as the concept catches fire industry-wide.

The brainchild of UP's Mike Iden, the genset locomotive is no overnight sensation. Iden began serious work on the concept in 2002 and gained UP approval to commission a prototype in 2004. "My vision," said Iden, "was to package the diesel engine, electrical generator and even the cooling system radiator in one compact, easily replaced module called a generator set or genset." The result, 2GS-14B prototype UPY 2005, was turned out of NRE's Mount Vernon, Ill., shop in November 2005 and dispatched to southern California for testing. The little center-cab, powered by a pair of 700-hp Cummins generator sets, performed well enough to prompt UP to commit to the concept by spring 2006 ... to the not insignificant tune of 158 units.

Designed for both fuel efficiency and reduced emissions, UP's genset switchers

Texas is genset country ... BNSF 3GS-21Bs 1233 and 1228 (upper left) work at Saginaw, Texas, while Fort Worth & Western 2GS-14B No. 2013 (far right) switches the Everman Industrial Park in suburban Fort Worth. On RailAmerica's Dallas, Garland & Northeastern (lower row, center), 2GS-14B No. 141 works at Carrollton. In California, UPY 3GS-21B No. 2709 (center and lower left) poses at West Colton. At lower right, Cummins genset awaits installation in UP unit at NRE's Mount Vernon, Ill. facility.

National Railway Equipment Co.

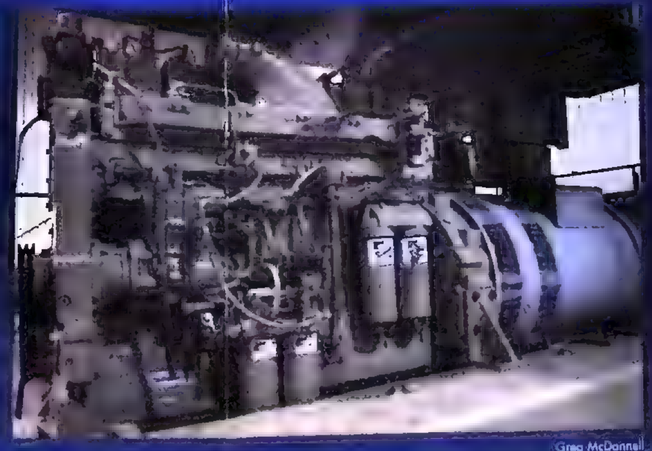
Blair Kooistra

Blair Kooistra

David Lustig

David Lustig

Wes Carr


Greg McDonnell

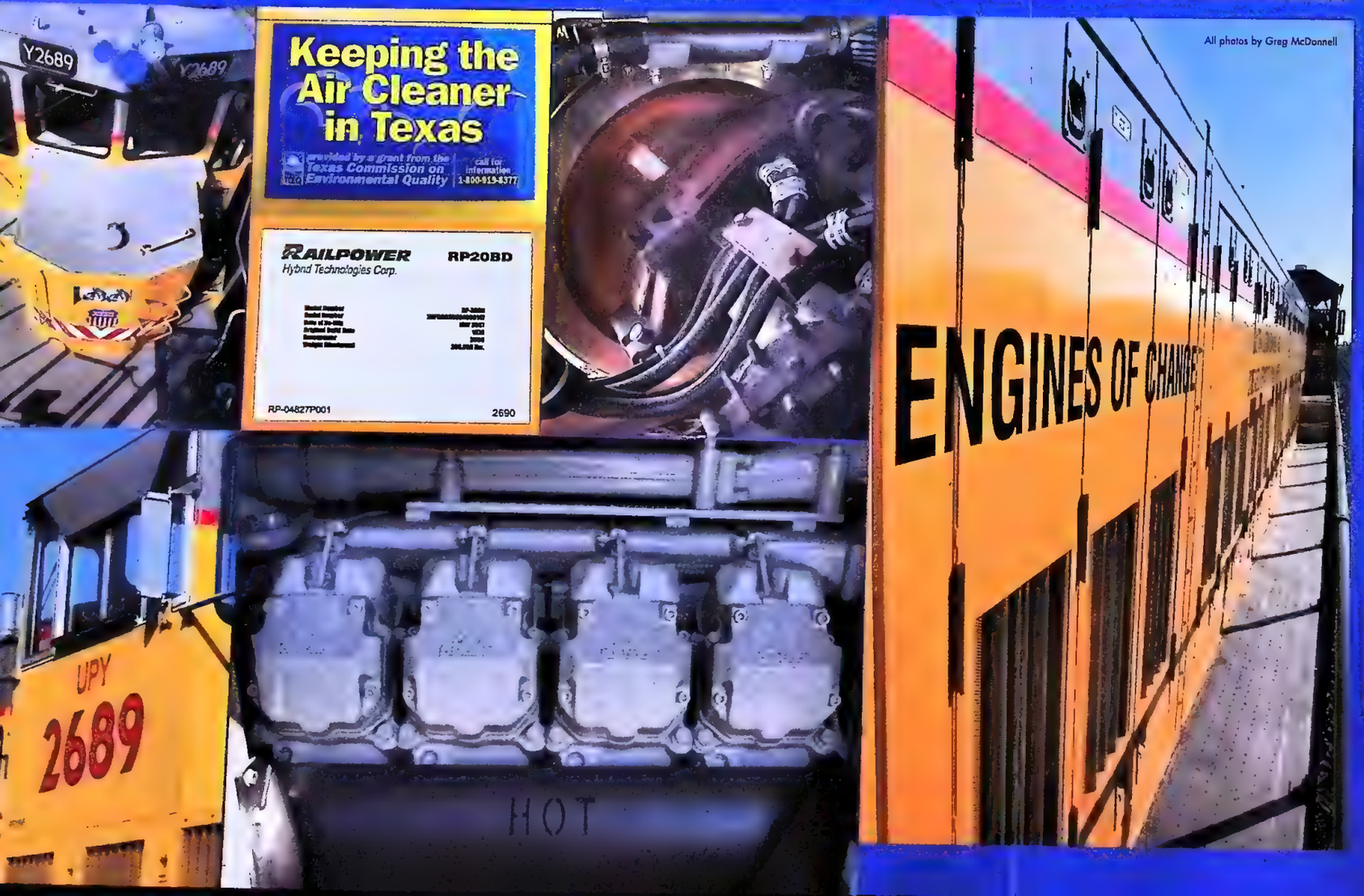
NRE N-VIROMOTIVE: By the Numbers

ROAD NUMBER	MODEL	QTY	DATE/LOCATION BUILT	NOTES
BNSF 1220-1261	3GS-21B	42	Dec. 2006 – Jan. 2007 Dixmoor, Ill. Mount Vernon, Ill. Silvis, Ill. Paducah, Ky.	
DGNO 140-141	2GS-14B	2	April 2007, Paducah, Ky.	Built on 3GS model frame with 2 gensets installed
FWWR 2013-2014	2GS-14B	2	May 2007 Mount Vernon, Ill.	Built on GP7/GP9 frames
NS – On order	3GS-21B	2	On order Mount Vernon, Ill.	
NS – On order	3GS-21C	1	On order Mount Vernon, Ill.	To be consructed on SD40 frame
NREX 2007	2GS-14B	1	Dec. 2006 Mount Vernon, Ill.	NRE demonstrator, built on EMD GP7 platform
NREX 2008	3GS-21B	1	2006 Paducah, Ky.	NRE demonstrator now on lease-purchase to MBCR Boston
NREX 2009	3GS-21B	1	On order Paducah, Ky.	Demonstrator / first customers KCS, Indiana Rail Road, CSX, CP
PHL 30-31	3GS-21B	2	On order	
PHL 80	3GS-21C	1	On order	To be consructed on SD50 frame
UPY 2005	2GS-14B	1	Nov. 2005 Mount Vernon, Ill.	NRE prototype; center-cab configuration built on frame of MP15DC SP 2690
UPY 2701-2760	3GS-21B	60	2007 Dixmoor, Ill. Mount Vernon, Ill. Silvis, Ill. Paducah, Ky.	
Volpe US ARMY – On order	3GS-21B	2	On order	

NRE N-VIROMOTIVE: Statistics & Specifics

MODEL	2GS-14B	3GS-21B	3GS-21C
Wheel arrangement	B-B	B-B	C-C
Engines	6-cylinder, 700-hp Cummins QSK19C (2)	6-cylinder, 700-hp Cummins QSK19C (3)	6-cylinder, 700-hp Cummins QSK19C (3
Traction motors	4 D77 or 78	4 D77 or 78	6 D77 or 78
Generator model	572RDL	572RDL	572RDL
Traction horsepower	1,400	2,100	2,100
Maximum speed	65 mph	65 mph	65 mph
Continuous tractive effort	44,165 lbs.	46,044 lbs.	73,084 lbs.
Starting tractive effort	77,407 lbs.	80,386 lbs.	136,500 lbs.
Adhesion	30 percent	30 percent	30 percent
Dynamic braking effort	N/A	N/A	Option
Weight (fully serviced)	258,000 lbs.	265,000 lbs.	est. 390,000 lbs.
Length	56' 2"	62'	65' 8"
Height	Any AAR plate standards	Any AAR plate standards	Any AAR plate standar
Fuel capacity	1,350 gals.	2,900 gals.	2,900 gals.
Oil capacity	80 gals.	240 gals.	240 gals.
Coolant capacity	45 gals.	135 gals.	135 gals.

RailPower Technologies



All photos by Greg McDonnell

RP TECHNOLOGIES: By the Numbers

ROAD NUMBER	MODEL	QTY	DATE/LOCATION BUILT	NOTES
NS – On order	RP14BD	2	2007 NS Juniata	SW1500 platforms from NS 2206, NS 2226
NS 100-101	RP20BD	2	March – May 2007 NS Juniata	GP38AC platforms from NS 2824, NS 2830
RPRX 5400	RP20BD	1	May 2006, Super Steel, Schenectady, N.Y.	GP40-SL platform from CN 9637
RPRX 5402-5406 (BNSF lease)	RP20BD	5	Jan. 2007 CAD, Lachine, Que.	Lease units built on B30-7A and B36-7 platforms
UPY 2602-2699	RP20BD	98	Sept. 2006 – July 2007 83 at Super Steel, Schenectady, N.Y., 15 at CAD, Lachine, Que.	B23-7, B30-7, B36-7 platforms
RPRX 5407	RP20BD	1	Nov. 2007 CAD, Lachine, Que.	GP9 platform from BNSF
RPRX 5600	RP20CD	1	Dec. 2007 CAD, Lachine, Que.	SD38/SD40 platform
NS – On order	RP20CD	2	Dec. 2007 Altoona, PA.	SD38/SD40 platform

RP TECHNOLOGIES: Statistics & Specifics

MODEL	RP14BD	RP20BD	RP20CD
Wheel arrangement	B-B	B-B	C-C
Engines	8-cylinder, 667-hp Deutz RP-500 (2)	8-cylinder, 667-hp Deutz RP-500 (3)	8-cylinder, 667-hp Deutz RP-500 (3)
Traction motors	D77 or 78	D77 or 78 – EMD platform	GE 752 – GE platform
Generator model	Newage	Newage	Newage
Traction horsepower	1,400	2,000	2,000
Maximum speed	65 mph	65 mph	65 mph
Continuous tractive effort	47,000 lbs. @ 5.5 mph	47,000 lbs. @ 9.3 mph	80,000 lbs. @ 9.3 mph
Starting tractive effort	88,000 lbs.	88,000 lbs.	134,000 lbs.
Adhesion	Greater than 30 percent	Greater than 30 percent	Greater than 30 percent
Dynamic braking effort	N/A	38,000 lbs.	58,500 lbs.
Weight (fully serviced)	Platform dependent	275,000 lbs.	Nominal: 392,000 lb s. Maximum: 400,000 lbs.
Length	44' 8" (SW1500 platform) 56' 2" (GP9 platform) 59' 2" (GP38 platform) 62' 2" (GE platform)	56' 2" (GP9/GP30 platform) 59' 2" (GP38 platform) 62' 2" (GE platform; B23-7, B30-7, B36-7)	68' 10" (SD38/40 platform) 67' 3" (GE C30/36 platform)
Height	Platform dependent	Platform dependent	Platform dependent
Fuel capacity	3,000 gals.	3,000 gals.	4,000 gals.
Oil capacity	74 gals. (37 gals. per genset)	111 gals. (37 gals. per genset) UP order: 63 gals. (37 gals. per genset)	111 gals. (37 gals. per genset)
Coolant capacity	74 gals. (23.5 gals. per genset)	70.5 gals. (23.5 gals. per genset)	70.5 gals. (23.5 gals. per genset)

Note: Deutz 2015 engine horsepower increases for the 2008 model year to 700 hp; traction horsepower will be 1,400 for RP14BD and 2,100 for RP20 series. The enhanced Deutz engine will also have a 5 percent improvement in fuel economy.

Matt Martin

Greg McDonnell

Craig Walker

RailPower demonstrator 5400 (upper left), built on the frame of CN GP40-2L 9637, works on CSX at Rochester, N.Y., in June 2007, while (above) lease units 5406 and 5403 (built on GE platforms) serve BNSF at Fresno, Calif., in March. At upper right, Juniata-built NS RP20BD No. 100 works local CE-11 at Leetsdale, Pa., in July 2007.

achieved both, establishing fuel savings of as much as 16 percent compared with conventional locomotives in similar service and reducing emissions of nitrogen oxides by 80 percent and particulate matter by 90 percent. The genset concept enables the locomotive to use one, two or three of its generator sets as required for power, traction or speed. The units are also designed to shut down when not needed, eliminating needless idling and emissions.

Following UP's lead, a number of railroads, including BNSF, NS, Dallas, Garland & Northeastern and Fort Worth & Western have been quick to jump on the genset bandwagon. Pacific Harbor Lines recently stepped up to order a trio of units for its Southern California port operations in Long Beach and Los Angeles, and Canadian Pacific, CSX, Kansas City Southern and the Indiana Rail Road have tested genset demonstrators or expressed interest in doing so.

Currently, both National Railway Equipment and RailPower Technologies offer 2-genset, 4-axle models as well as 3-genset locomotives, available in 4- and 6-axle configuration. NRE's locomotives are powered with 6-cylinder Cummins diesels and principally built on newly fabricated frames, although remanufactured platforms can be used and have been employed on several orders. NRE builds genset locomotives at its Illinois shops in Dixmoor, Mount Vernon and Silvis, as well as its former VMV facility located in Paducah, Ky.

RailPower locomotives are equipped with V-8 Duetz diesels and are constructed on remanufactured frames of EMD and GE locomotives. Lacking an assembly facility of its own, RP has contracted Super Steel in Schenectady, N.Y., to construct most of its locomotives, but has also used CAD in Lachine, Que., and recently supplied kits for Norfolk Southern to build several of its own units at its Juniata Shops in Altoona, Pa.

In spring 2007, the Society of Automotive Engineers — a worldwide standards-setting organization dedicated engineering in automotive, aerospace, aviation and off-road industries — awarded the mobility and engine emissions category of its prestigious Environmental Excellence in Transportation (E2T) award to UP in recognition of the railroad's pioneering work in development of the ultra-low emitting genset locomotives.

In their first full year of production, genset locomotives are already at work across the nation, working Southern California yards and locals, hauling transfers in Texas, and performing way freight and yard work on NS in Pennsylvania. They are, as UP stencils on its genset locomotives, "Engines of Change," and they're quickly gaining acceptance with operating crews ... and with the North American railroad industry at large. 1

Built to Last

By Andy Cummings

Norwegians are a quiet bunch to begin with. But once engineer Nathan Larson stretches the slack out of his train and notches his throttle up, conversation becomes impossible, anyway. Otter Tail Valley Railroad GP18 No. 181 and three cohorts are barking for all they're worth as they try to coax 116 steel hoppers and 10,000 tons of coal up to track speed beneath the modest skyline of Fargo, N.D.

An impressive number of 567-engined Geeps can boast of continued operation in the 21st century, but few of them work as hard as these. I attended college in Moorhead, Minn., Fargo's twin city, and learned to love watching and listening to these guys work. You could tell right away when Otter Tail was in town — even from campus, you could discern their Nathan P5s from the monotone BNSF horns instantly.

GP9s 1463, 1483, and 1484 wore the lettering of Minnesota Northern, once a sister railroad in the RailAmerica family. When Minnesota Northern went independent, the three engines stayed on Otter Tail. These were my favorites, as

their previous owner was the Dakota, Minnesota & Eastern, the railroad I'd grown up on and would later work for. Prior to that, they'd served on the Norfolk & Western, and originally, in the employ of the Nickel Plate.

Otter Tail's two GP18s, Nos. 181 and 192, bear the distinction of having been delivered to the old Norfolk Southern Railway with low short hoods, then having high short hoods installed and oriented for long-hood-forward operation when Southern Railway took over. They're still that way.

When the once-weekly coal train (bound for Otter Tail Power's Hoot Lake plant near Fergus Falls, Minn.) showed up at Fargo, they'd fire up four of the five to do the job. They sounded great for the whole 60-mile run, but the best spot to experience them was on the .8-percent ascent out of the Red River Valley south of Barnesville. When they doubled the hill, the sound was great. When they dragged the whole train up at once, it was indescribable. They'd seldom make more than a few miles an hour.

The performance is a credit to the folks who designed and built engines that, pushing age 50, can take hold of such a heavy train and just keep pulling. It's also a credit to the railroad's diesel mechanic whose name, fittingly enough, was Merlin.

Since I graduated and moved away in 2003, Otter Tail has picked up one GP39-2, but the old 567s still pull most of the weight; the GP9s will turn 50 in 2009. Talk about being built to last. ▪

Otter Tail Valley Railroad GP18 No. 181 and three 567-powered cohorts give their all as they struggle over the rolling prairie near Rothsay, Minn., with 116 steel hoppers and 10,000 tons of coal bound for Otter Tail Power's Hoot Lake plant near Fergus Falls on Dec. 8, 2002.

LMX B39-8s

Find good homes in New England (and elsewhere)

By Scott A. Hartley

They were the hottest things on rails when they were built two decades ago: 100 General Electric B39-8s built for lease to Burlington Northern through GE component LMX. Today, a half-dozen years after the units were returned to the lessor at expiration of the agreement, many of the LMX B39-8s have found productive second careers in the United States and Canada. They've proven most popular in New England, where no fewer than 31 former LMX B39s have found post-retirement employment on four of the region's railroads.

GE's Dash 8 technology, first rolled out in 1982, introduced microprocessor circuitry, improved adhesion, and beefed-up alternators and traction motors to the GE line. It also was the builder's ticket to surge ahead of traditional diesel sales leader Electro-Motive. The 100-unit LMX deal constituted the largest single order for a four-motor GE Dash 8 model.

When LMX 8500-8599 rolled onto BN property in 1987 and 1988, the railroad still favored B-B units on its fastest freights and intermodals. The tall, angular 3,900-hp B39-8s quickly found a home on BN's premier trains between Chicago and the Pacific Northwest.

Their role at center stage was brief, however, as longer and heavier intermodal trains soon dictated North American railroads' transition to bigger six-motor power. Relegated to secondary main line and even local freight tasks on the newly merged Burlington Northern Santa Fe, the LMX units could be found all over the West for a few years.

BNSF returned the 93 surviving B39s (seven were wrecked) upon the expiration of their lease in 2001. Many found employment in operating lease fleets, including those of CIT Financial and *Relco*, and took up temporary employment helping out power-short Class Is. Others have been sold or leased to short lines and regional railroads across the continent. A dozen went to BC Rail in western Canada and a pair to Florida's Seminole Gulf. Three more are on Nashville & Eastern in Tennessee. But their major stronghold is in New England's six states: on Providence & Worcester; Connecticut Southern; Montreal, Maine & Atlantic; and Bay Colony. All are very different operations, but each has found the B39-8 to be a valuable addition to its roster.

P&W, which operates its own lines and handles freight service on Amtrak's Northeast Corridor in Rhode Island and Connecticut, replaced older second-hand U23Bs with nine B39-8s. Painted in the road's attractive orange and brown, they joined P&W's largely GE roster and can

Exercising trackage rights on the Housatonic Railroad, P&W engineer Tom Mik puts 10,800 GE horses to work as B39-8s 3909 and 3902 team with cab-less, ex-BN B30-7A 3006 (upper left) to lug a westbound stone train over the storied New Haven Maybrook Line at Shelton, Conn., on Oct. 21, 2006. Still in LMX paint and carrying their original road numbers, Connecticut Southern B39-8s 8565 and 8554 lead a northbound freight over the Connecticut River bridge on Amtrak's Springfield Line at Enfield, Conn., on May 21, 2005. MM&A 8592 and 8569, the first — and so far only — units to be repainted (below), work back to back at Farnham, Que., on May 23, 2007.

Scott A. Hartley

Ryan Parent

Scott A. Hartley

Southbound CSOR train CSO1 rattles the windows in downtown Meriden, Conn., as B39-8s 8554 and 8552 roll West Springfield-Cedar Hill tonnage through town on Dec. 22, 2001.

work on any assignment on the system. Road Foreman of Engines Tom McCarthy praised these GEs, saying that the B39s will "dig in under a load." He noted that a trio of the bigger engines replaced four U23Bs on stone trains running over Metro-North and Amtrak to Long Island, saving on fuel and maintenance costs.

P&W's B39s may no longer enjoy their former glories of hauling freight over Washington's Cascade Range, but their present assignments are no less impressive. The P&W units have seen runthrough unit-coal train service over connecting main lines. More dramatic are their outings on the Northeast Corridor, where they work local freight assignments on a line dominated by 150-mph Amtrak Acela Express trains. Providence & Worcester diesels are equipped with sophisticated ACSES cab signal and train control systems to operate on the NEC. (P&W liked the B39s enough that the railroad also picked up four successor-model Dash 8-40Bs once owned by the Susquehanna. They operate interchangeably with the ex-LMX units.)

Six more B39-8s are on long-term lease to Connecticut Southern, which handles freight on Amtrak's Springfield, Mass.-New Haven, Conn., line, as well as several branches around Hartford. The choice of GE diesels may seem surprising for CSOR, which is owned by virtually all-EMD RailAmerica. "We were tooled up for them," explained railroad Assistant General Manager Stephen Wichmann. When CSOR assumed operations from Conrail in 1996, it acquired six CR B23-7s, so the larger and newer B39-8s were a likely successor as the new railroad's operating and mechanical crews already were familiar with GEs.

All continue to carry LMX gray. One of the six is frequently used on road freights of fellow RailAmerica company New England Central in Massachusetts, Vermont, and New Hampshire, in exchange for an NECR EMD used in Hartford local service. All of CSOR's B39s remain in LMX gray and carry their original road numbers. They're equipped with cab signal and locomotive speed limiter controls to run on Amtrak where they handle freight trains, frequently more than 100 cars long, at 50 mph.

Currently, title to the largest fleet of ex-LMX B39s is held by Montreal, Maine & Atlantic, operator of the former Bangor & Aroostook Railroad system in Maine, along with several Canadian Pacific lines in Maine, Quebec and Vermont. The road operates 15 B39-8s and a variety of GE C30-7s. The six-motor units usually rule the east-west ex-CP main, while the high-horsepower B-Bs handle the Maine BAR trackage and the border-hopping CP route between Farnham, Que., and Newport, Vt.

MM&A picked up the B39-8s as they were in relatively good condition and available in appropriate numbers at a reasonable price, according to President Robert C. Grindrod. Just two of the B39s currently wear the maroon and gold colors brought from the Wisconsin Central by railroad founder Ed Burkhardt. Plans are for all 15 to be eventually repainted. All retain their original LMX numbers.

One more ex-LMX B39, still carrying number 8580 in spring 2007, works for Bay Colony Railroad on Cape Cod and in southeastern Massachusetts.

Glenridge Leasing Co. LLC, associated with the BCLR, owns the 8580 and two more LMX B39s on sister road Seminole Gulf, according to company president Gordon Fay. "We are very happy with the units," he said. "The productive capacity of these units will allow retirement of older units." According to Fay, the Bay Colony GE should be repainted into the road's gray, orange, and yellow colors by the end of this year.

They may have been cutting edge when they rolled out of Erie 20 years ago, but today's sophisticated GE and EMD offerings make the LMX units appear somewhat primitive by comparison. The New England operators of B39-8s all have positive comments about these locomotives, but that doesn't mean that they're without problems.

"They're slippery when it's wet," CSOR's Wichmann said, "but in dry weather they pull well."

P&W's McCarthy explained that these units are early Dash 8 technology. "The wheel slip control is not as refined," he said, noting that when the system detects slipping, power will drop, sometimes reducing speed unnecessarily.

"They sometimes get themselves tangled up in their sophisticated computer system, reporting faults where no faults exist. They were built for high-speed intermodal service, and are somewhat lacking in slower speed and switching service," said Grindrod of MM&A's fleet of B39s "Overall," he noted, "they are good units."

And while P&W and CSOR employees had years of General Electric experience, there has been much to learn on Bay Colony and MM&A. Grindrod recalled, "BAR was an all-EMD road, so there was a period of adjustment for both the T&E and mechanical forces to get them accustomed to the foibles of GEs."

Despite the heavy reliance on high-horsepower six-motor power by North America's railroads, there still are many assignments where only a four-motor will do. Both GE and EMD stopped building new B-B freight units in the early 1990s, and today's price for a reconditioned GP38-2 is well beyond the limited budgets of many smaller railroads.

For a quartet of New England railroads, the former LMX B39-8s have proven to be versatile locomotives at a good price. ■

Ryan Parent

Scott A. Hart

Montreal, Maine & Atlantic B39s, No. 8525 in tattered LMX colors, and 8592 in handsome MM&A maroon and gold (upper), work side by side at Farnham, Que., on May 23, 2007. Providence & Worcester B39-8 3906 and B30-7A 3006 (above) shove on the rear of a Danbury-bound stone train working through Devon, Conn., on Metro-North trackage, on Oct. 7, 2006.

BV Spark and Wire

937 937

Mirror, mirror on the wall,
Who is the meanest machine of all?

By Greg Gormick

Were locomotives vocal and conceited, the ones that would grin when they asked that question today would be electric. So it has been for nearly a century. But today's swiftest and strongest prowlers of the high iron wouldn't speak in Yankee tones. No, their accents would be German, French, Swedish, or even somewhat Canadian, eh.

This fantasy only underscores the fact that mainline electric traction in North America is full of irony and inspiration. Ironic that America first proved the superiority of propelling trains by spark and wire rather than by superheated steam or turbocharged diesel. Ironic, too, that these superior beasts remain among the rarest in American railroading. There are less than 200 electric locomotives in mainline or captive resource road service on this continent, with 185 confined to the passenger lines of the Northeast.

New York, New York! Threading a maze of crossovers and a spider web of catenary, Amtrak AEM7 937 encounters an outbound NJ Transit commuter train on the approach to Penn Station with No. 642. At right (upper), pantograph of NJ Transit ALP46 reaches for current, while homeward commuters (below right) pass NJT 4616 on the platform at Dover, N.J. — All photos Greg McDonnell

Matt Van Hattem

Racing through Rahway, N.J., a "good place to see that natural medium of motive power," Amtrak AEM7 953 whisks a three-car Keystone Service consist from Harrisburg to New York.

You'd have to be impressed by these machines

True, there are about 3,000 electric multiple-unit (EMU) cars plying commuter rails, everywhere from Manhattan to Montreal to Michigan City. Efficient and reliable they may be, but they're as exciting as overgrown subway cars. It's the locomotives — "motors" — that carry the mystique of electric railroading.

This elite passenger stable of five breeds from three European bloodlines provides the real inspiration. Their daily service maintains the dream of skimming the ground on ribbons of steel and a streak of chained lightning. While that dream frequently flickered here, it drove other nations to string catenary and sire designs so successful they're burnishing our North American rails, too.

Should we be surprised that electric locomotives continue to beat the odds, even in oil-addicted America? As early as 1899, a now-forgotten magazine called *The Western Electrician* predicted, "Electricity is the natural medium for the application of motive power. Its supply is unlimited. It is everywhere. It is to movement what the sun is to growth." A good place to see that natural medium of motive power today would be on the high-level platforms of New Jersey Transit's Rahway station any weekday between 5 and 6 p.m. This is Amtrak's Northeast Corridor, the high-speed showcase that evolved out of the electrified, multiple-track "Broad Way" of the Pennsylvania Railroad. Twenty-three times in 60 minutes, you'll hear the "ping" of protesting catenary seconds before you see headlights and detect that characteristic motor moan. The parade will include:

- An Amtrak train from Harrisburg, Pa., under the reliable care of an AEM 7, the Swedish-bred powerhouse that started the march to foreign designs;
- NJT trains of single-level Comet cars behind the AEM7's younger sister, the ALP44, heading for Long Branch, N.J., on the North Jersey Coast Line;
- Sets of new NJT multilevel cars hurtling to and from Trenton behind German-built ALP46s;
- Amfleet-equipped Regional trains that depend on the French innovation inside their menacing-looking HHP8 locomotives to get them everywhere from Boston to Washington on time; and
- Six-car Acela Express trainsets, punctuated at both ends by needle-nosed motors working in unison to give North America's fastest trains their 12,000-plus horsepower punch.

You'd have to be impressed by these machines, each of them meaner in speed and power than any contemporary diesel locomotive catalogued by General Electric or Electro-Motive Diesel. But if your nationalistic tendencies run deep, you'd also be perplexed at the sight of

Both photos Greg McDonnell

these obviously American trains coupled to locomotives that obviously aren't.

To find the reasons for this foreign invasion, you must delve back through about 50 years of American electric traction history, especially on the Pennsylvania, the poster child for main-line electrification. Standing on that same platform at Rahway back in 1957, you'd see a true American transportation juggernaut, but one facing cautionary signals, particularly in motive power. This was a railroad dominated by three aging equipment types:

- 139 dual-service GG1s, geared for 100- or 90-mph service and capable of being overloaded for short periods to double their continuous rating of 4,620 hp;
- 92 P5 motors, the stubby predecessors of the GG1s and main handlers of the freight traffic under the wires; and
- A massive fleet (more than 500 at their peak) of owl-faced MP54 commuter EMUs that moved millions daily.

At North Philadelphia, Amtrak HHP8 652 (upper) passes the old Pennsy interlocking tower and statio with New York-bound train 176 on May 2, 2007. Amtrak and MARC motors (above) rub shoulders at Washington Union Station as Maryland-owned HHP8 4913 and AMTK AEM7 917 await the afternoon rush.

As well built as this equipment was, it couldn't run forever. The oldest pieces were already beyond their optimum lives.

The PRR mechanical department had replacement freight and commuter electric strategies well in hand by the late 1950s. The 3,750-hp P motors gave way to 66 husky E44s from GE beginning in 1960. Rated at 4,400 hp, their output was boosted to 5,000 when silicon diode rectifiers replaced their fluid-cooled ignitron originals. Influenced by diesel practice and employing diesel-style frames, carbodies, and traction motors, the E44s were a solid success and a step forward.

So were the MP54 commuter replacements. Six prototype Silverliners scored with railroaders and riders when Budd delivered them to the Pennsylvania in 1958 for Philadelphia service. TRAINS described the rectifier-equipped cars as "a powerful argument that endless expressway and off-street parking construction are neither the final nor economical answer to rush-hour commutation."

Local and state governments eventually agreed, and backed their approbation with public money to support the deficit-generating commuter services. Philadelphia's first step was to buy 38 Silverliners for lease to Pennsy and 17 for Reading in 1963. More publicly funded copies followed, eventually joined by the derivative Jersey Arrows.

"We looked at the possibility of new Gs ... but we found we couldn't just duplicate them in-kind."

The third and most difficult piece of Pennsy's power puzzle was a GG1 replacement. The decisions made (or not made) around it have a direct bearing on the motors zipping up and down the Northeast Corridor today. The GG1s were the most versatile members of the fleet, handling frontline corridor and long-distance passenger trains, New York-Philadelphia Clockers, and commuter consists, as well as doubling on freight. They were not easily replaced.

"We looked at the possibility of new Gs," recalled Tom Harley, who rose up through the mechanical ranks of the PRR and its successors between 1949 and 1979, when he left to become senior vice president of Trailer Train. "They were absolutely superb. But we found we couldn't just duplicate them in-kind."

One obstacle for a second-generation G was the articulated cast-steel frame that was central to the original's 2-C+C-2 design. By the 1950s, no foundry was willing to pour castings this large. Those frames also caused problems with the existing fleet, with cracks becoming an increasing issue as they aged.

"The government inspectors tended to make more of this than was warranted," Harley said. "We never had an accident due to the cracks, but we never came up with a completely satisfactory solution. This would, along with other factors, contribute to their eventual retirement."

Tests were conducted with an EP-5 rectifier passenger motor soon after GE delivered 10 to New Haven in 1955. But the 5,000-hp "Jets" were custom-designed for the short New York-New Haven route and the weight restrictions of the Park Avenue viaduct leading into Grand Central Terminal. They weren't suited to heavy, 100-mph trains on longer Pennsy runs that kept them humming for hours on end. Creating a new motor with the speed and stamina of the GG1s would prove difficult and, for often non-mechanical reasons, was delayed repeatedly.

The situation was far different in other countries that had committed the public funds necessary to advance both pas-

NJ Transit ALP44 No. 4419 enters New York's Penn Station with a "Midtown Direct" train from Dover, N.J.

All photos Greg McDonnell

NJ Transit ALP46 No. 4624 speeds past Long Island EMUs and NJT Comet coaches as it exits Penn Station for the Hudson River tubes. Constructed by Adtranz at Kassel, NJT's 29 ALP46 motors are the latest European electrics to grace North American rails. Odds are good that they won't be the last.

senger and electric-traction technology. That was driven home with the 1964 launch of Japan's New Tokaido Line between Tokyo and Osaka. This, the world's first true high-speed service, used bullet-nosed, multiple-unit trainsets, not locomotive-hauled equipment. It intrigued railroaders and shocked politicians. How could a nation laid waste by war only 19 years earlier vault so far ahead of America?

Trying to out-Japanese the Japanese

The question burned in some influential minds. The result was President Johnson's High-Speed Ground Transportation Research and Development Act of 1965. Its major component was an agreement linking Pennsy and the feds in a $55 million Tokaido-inspired project for the New York-Washington section of the Northeast Corridor. So were born the 61 Budd-built Metroliners — a sea change in American intercity electric practice.

To be sure, EMUs (which the Metroliners were) offer some advantages in the high-speed field. Distributing the heavy electrical gear throughout the train instead of concentrating it in a locomotive means less track stress. With each car powered, performance is not affected by train length. Using the traction motors on each car to provide dynamic braking can provide smoother, quicker deceleration.

But was it this performance or Tokaido envy that led to the decision in favor of EMUs on the Northeast Corridor? Bob Watson, the railroad's coordinator on the high-speed project, believes it was probably a combination. He points to the 160-mph Metroliner objective as one example of trying to out-Japanese the Japanese. Tokaido's test record was 159, so America literally had to go them one better.

At the Pennsylvania stockholders' meeting of May 8, 1967, Chairman Stuart Saunders boasted, "Within six months, we will introduce the best rail passenger service anywhere in the world — the Japanese Tokaido Line notwithstanding."

Not quite. Not within six months, not within a year, not ever did the Metroliners take the crown as the world's finest trains. The mixture of federal interference and bureaucracy, a financially sick railroad, the politically motivated division of the contract for the electrical gear between fierce rivals GE and Westinghouse, and inadequate infrastructure often proved a sour cocktail.

"My title may have been coordinator, but there were times when it all seemed pretty uncoordinated," Watson said. "We did eventually get them up to a reasonable level of reliability and they did bring some decent service to the Corridor for the first time in years. But there weren't enough to cover all the schedules and we still had locomotive-hauled consists on the Corridor."

The problem passed to Amtrak in 1971. It crafted a capital plan that would retire the aged equipment inherited from the railroads, including its share of the declining GG1 fleet. Various options were considered, including a second generation of Metroliners. What emerged was a request for bids on high-speed passenger motors (electric freight service was now the responsibility of Penn Central).

Amtrak 2025 heads for Washington with one of 20 6-car, 150-mph Acela train sets in the Boston-Washington circuit.

Joe Osciak

In addition to Amtrak's fleet of AEM7s, Pennsylvania's SEPTA and Maryland's MARC commuter operations also roster AEM7 motors. SEPTA 2307, one of seven in Philadelphia-area service, calls on Bryn Mawr, Pa., with train 9555 on April 11, 2006.

As the industry's original and leading supplier of electric locomotives, GE was an obvious bidder. Yet by the early '70s, diesel champion EMD was stimulated by the renewed interest in electrification that flowed from public environmental angst and industry worries about long-term oil cost and availability. To meet GE's competition, EMD forged an agreement for the use of Swedish builder ASEA's technology in American-built passenger and freight motors. ASEA's credentials were impressive, especially its use of thyristor solid-state semi-conductors.

Still, GE snagged Amtrak's order for 26 E60Cs. Watson — who had moved from Penn Central to Amtrak consulting work being done by LTK Engineering for the Federal Railroad Administration — recalled the GE contract as "a foregone conclusion" because of the company's lobbying clout in Washington.

The E60s' streamlined, double-cab carbodies looked advanced, but they were little more than re-wrapped E44s, albeit with the thyristors pioneered by ASEA. And they were heavy (193 ½ tons), derailed, tore down catenary, and limped from one service failure to another. The E60s were *not* the answer, especially when the FRA shackled them at 90 mph, not the expected 120.

The history lesson ends here. The contemporary story starts at Elizabeth, N.J., in July 1976, where a dockside crane lifted Swedish State Railways 1166 off the *Atlantic Conveyor* and on to American soil. Wearing Amtrak's red, white, and blue paint and test number X995, this 92-ton ASEA Rc4 motor changed the course of American electric railroading.

The person to thank for this revolution is Amtrak's second president, Paul Reistrup. Infuriated by the lack of American equipment quality, he told taxpayers he was going overseas to get them "the best passenger-train technology in the world."

As part of this strategy, Reistrup's team brought over X995 and a French rival. The stylish, six-axle CC 21003 of French National Railways (SNCF) wasn't amused. Though the Alstom-built beauty had an admirable record on the

glassy smooth track at home, it didn't like the geometry of the Northeast Corridor. After derailing at speed and snagging the wires, the French speedster's tests were cut short and she returned overseas to haul trains like *Le Capitole* at 135 mph back home.

Pushing the envelope

But X995 — first dubbed the Meatball and later Mighty Mouse — quickly demonstrated the inherent qualities that, with some modifications, made it a perfect fit. Fast, light, sure-footed, and highly efficient, the deceptively small foreigner paved the way for three orders to EMD for 54 AEM7s — the "A" standing for ASEA, "EM" for Electro-Motive, and "7" for its 7,000-hp output. Their fluted Budd carbodies contributed to a third nickname: Toasters.

Hauling Amfleet rolling stock on a marginally upgraded physical plant, the AEM7 solidified the dream of 125-mph service that would draw travelers off overcrowded highways and out of wing-locked airports. In quiet, Scandinavian fashion they did much to lift Amtrak's reputation. They also migrated deftly to commuter service, with seven serving on Southeastern Pennsylvania Transportation Authority (SEPTA) and four on the Maryland Rail Commuter (MARC) Penn Line.

Today, Amtrak's deputy chief mechanical officer, Mario Bergeron, reports the AEM7s — including the 29 motors upgraded between 1999 and 2002 with A.C. traction and insulated gate bipolar transistor technology — are reliably clicking off 125,000 miles annually. With a minimum life expectancy pegged at 30-35 years, all of the AEM7s still have some miles to go before they sleep.

In fact, these deceptively compact locomotives could lay claim to being the most successful electrics of all time. Their development goes back to 1962, when six experimental Rb-series motors first hit Swedish rails and pioneered the use of thyristors for everything from current rectification to wheelslip control. The Rc1 debuted in 1967, to be followed by another seven variations that found homes not just in Sweden and the United States, but also Norway, Austria, Turkey, Iran, and the former Yugoslavia, sometimes under licensing agreements such as the one forged with EMD.

The Rc story is one of constant refinement and adaptation that is even apparent in its American variations. When the hoped-for electrification bonanza didn't pan out and EMD lost heart, ABB Traction (formed from the merger of ASEA and Brown Boveri) turned to its Rc6 to produce ALP44s for U.S. consumption — 32 for NJT and a single SEPTA unit to run interchangeably with its AEM7s — which only proves that, if the climate is right for railroads (publicly or privately supported), the industry will invest in the refinement of products they will buy.

It would be nice to report that America's next step in the advancement of electric traction followed the path blazed by the AEM7. It didn't. But then the $1.3 billion project to upgrade the Northeast Corridor for operation above 125 mph, extend the catenary from New Haven to Boston, and acquire both high-speed trainsets and high-performance motors was bound to be risky.

The eventual high-speed sets are, of course, Amtrak's 150-mph Acela Expresses and the motors are the HHP8s. The procurement process began in January 1993. Former Amtrak equipment acquisition department staffer Rich Annechini was by then LTK Engineering's project manager on this high-powered consulting job. He jokingly recalled that his security card had a photograph of him with his natural hair color, "but it was considerably greyer by the time we wrapped things up nearly 10 years later."

At first, it seemed the equipment strategy might emulate the AEM7 model. ABB brought its five-car, motor-hauled tilt train, the X2000, from Sweden for Northeast Corridor testing and a diesel-powered national tour in late 1992. The German Siemens-AEG consortium did the same in early 1993 with a six-car, double-motor-hauled version of the non-tilting InterCity Express.

"We had extensive formal communications with all the European builders," Annechini said. "But Amtrak really wanted to push the envelope as much as possible and create something that reflected the Amtrak culture. There was also considerable input from the FRA because we had to meet their crashworthiness standards, which had increased since the acquisition of the AEM7s. Adaptation of the X2000 and ICE wouldn't have been simple."

Trailing on a push-pull train, MARC HHP8 No. 4912 departs Seabrook, Md., with Baltimore-Washington No. 411 on March 27, 2006.

Joe Os

American Flyer

Enter a consortium of Canada's Bombardier Transportation and France's Alstom. Greasing the wheels for their all-new "American Flyer" was the financing offered by Canada's Export Development Corp. to help secure the work, which would be done in Canada, as well as the United States and Europe. The consortium won the 1996 contract to deliver 20 locomotive-hauled trainsets, 15 motors for accelerated conventional trains, and contract maintenance at three purpose-built facilities within Amtrak's Boston Southampton Street, New York Sunnyside, and Washington Ivy City yards.

The high-speed trainsets combined proven components and subsystems, such as the general carbody design and suspension/tilt systems employed by VIA's Light, Rapid, Comfortable trains, and propulsion systems and truck designs from Alstom's BB36000 Astride locomotives, all with a dash of TGV. (France had taken delivery of 60 dual-service Astrides between 1996 and 2001.)

"We aimed for as much synergy as possible between the two Amtrak locomotives," Annechini said. "There are some differences between the Acela trucks and those for the HHP8. We were using proven elements, but these were whole new packages operating in an entirely different environment."

For a time, it looked as if the packages and the environment weren't going to couple. The gory details have been reported extensively. Launched a year late in 2000, the Acelas and the brutish HHP8s had their share of embarrassing escapades. It all culminated in Bombardier hurling a lawsuit at Amtrak and the corporation hurling one back at it. Cooler heads prevailed and the suits were dropped, with Bombardier bowing out of the maintenance contract early.

Another Metroliner? Probably not. Amtrak has made the Acela trainsets and the HHP8 motors work. As of July 2007, the Acelas are now logging 160,000 miles annually and 16 are available daily, leaving the others in planned maintenance and guard service. "They had their problems, but they're now hitting their performance targets," Annechini said. "Most importantly, the public likes and uses them. I think Amtrak deserves a lot of credit for that equipment."

The HHP8 even had one follow-up order. MARC operates six in Baltimore-Washington Penn Line service on the Northeast Corridor, where they congregate daily with their 15 Amtrak sisters and the 49 active AEM7s. They also rub shoulders with both of them when they go to Amtrak's former Pennsy motor shop in Wilmington, Del., for overhauls.

The latest motor in the Northeast took a different route to service, more along the lines of the AEM7. It was similarly derived from a debugged model in Europe, this time the Class 101 that was produced 145 units strong for Deutsche Bahn at Kassel, Germany. Builder Adtranz (formed from another merger that took in ABB and has since been swallowed by Bombardier) turned them out in 1996 as 135-mph power for InterCity and EuroCity passenger services. They had teething problems, but gradually settled down.

Framed by one of its own wheel sets, Amtrak AEM7 937 rests on jacks in the midst of an extensive overhaul at Amtrak's Wilmington, Del., locomotive shop on May 2, 2007.

Both photos, Greg McDonnell

On the floor of the same Wilmington, Del., shop that once tended to legendary Pennsylvania Railroad P5s and GG1s, Amtrak workers maintain and overhaul a new generation of electric locomotives. Built by the Pennsy in 1903, the Wilmington facility has served as the main electric locomotive shop for PRR, Penn Central and Amtrak. Viewed from the overhead crane, AEM7s, MARC 4901 and Amtrak 927, 937, and 945 share the floor with HHPs 661 and 664.

Working with specs set by NJT and STV Consulting, the builder came up with the ALP46 commuter variant. This motor has to exert more drawbar pull than the ALP44s in order to handle up to 10 of the new Bombardier multilevel cars. The rolling stock is critical to generating more capacity within the constraints of the two Hudson River tubes out of Penn Station. The ALP44 is limited to five multilevels. And while the ALP46 doesn't need all the speed of its German prototype, it has to sprint at 100 mph in order to mix with Amtrak's Northeast Corridor trains.

One slight but significant change in the ALP46 is the substitution of 40-inch drivers for the Class 101's 44-inch wheels. Considerable work went into meeting FRA crashworthiness standards without drastically increasing weight. The fleet leader, 4601, was rolled out at NJT's Meadows Maintenance Center on April 10, 2002. Today, it and 28 siblings are holding down assignments throughout the former Pennsy and Lackawanna electric commuter lines.

While the ALP46 may be the latest foreign-built passenger motor in North America, chances are it won't hold the honor for long.

Lightning strikes

Caltrain's Project 2025 is wrapped around electrification of 52 miles of its ex-Southern Pacific Peninsula Commute service from San Francisco (and a new tunneled station at the Transbay Terminal) to San Jose. One scenario suggests using non-FRA compliant European bilevel EMUs, which would either eliminate the line's remaining Union Pacific freight service or restrict its hours through temporal separation. Two options are electric haulage of existing rolling stock or complete replacement with new low-floor bilevels. The ALP46 locomotive has been used as the model for Caltrain's calculations so far. A decision must be made next year.

Meanwhile, in June 2007, the government of Ontario announced a C$17.5 billion transit capital expansion for Toronto. One element is the electrification of GO's 72-mile Lakeshore Line. Canadian National owns much of the Lakeshore Line and it's difficult to imagine the removal or restriction of freight operations necessary for non-FRA EMUs. There is no compliant, fully bilevel version today, so the wise money is riding on new motors push-pulling GO's distinctive bilevel rolling stock.

Fifty years ago, the number of electric locomotives on North American rails was falling and it looked like the pantographs might be dropped for the last time. Now, environmental concerns, declining oil reserves, price shock at the pumps, and the undeniable efficiency of today's electric locomotives suggest they're not the end of a long and noble line, but the beginning of a new one. Obviously, lightning can strike twice — especially i electric railroading. I

David Styffee

DETROIT IRON (Horse)

J. David Ingles

Its unique styling has made EMD's GP30 a model for the ages

By J. David Ingles

Steve Glischins

One of more than 120 GP30s in BNSF's remarkable stable, 2804 — a Morrison-Knudsen rebuild constructed in 1963 as SP 7402 — leads a rail train at Victoria Street in St. Paul, Minn., on Sept. 29, 2005.

What has made EMD's GP30 such an icon? The short answer: It's the styling. Specifically, the "brush-back" cowling on top, right behind the hood, flaring back around the dynamic brake grids. What else could have made this unique-looking locomotive such a sought-after, chased-down sacred cow over the years compared with its immediate predecessor, the GP20, and its successor, the GP35? Why else would some diesel devotees even care how many GP30s survive?

Certainly a GP30's innards were not unique. The model's 16-cylinder, 2,250-hp, 567D3 prime mover followed in logical progression the GP20's 2,000-hp 567D2, and was subsequently upped by the 2,500-hp 567D3A in GP35. Similarly, the volumes built increased each time as the "second generation horsepower race" was gearing up. Only 260 GP20s were built (for nine railroads excluding EMD's own demonstrators), versus almost 950 GP30s (29 roads) and more than 1,300 GP35s (43 roads). It wasn't quite like GM's autos of the time — a new model each year — but the GP20-3 time span totaled only seven years, basically 1959 to the end of 1965.

Of the three, though, the GP30 was the only one introduced in the Motor City, and at "an event," and the only one with any extra "styling." That cowl also the rooftop was designed by folks who usually were concerned with Impalas and 88s and Roadmasters. The key t remember here is that General Electr had jumped into the domestic pool i 1959 with its 2,500-hp U25B as the "horsepower race" was getting unde way. EMD, forever the diesel leader,

Still turning heads at age 44. Working the third La Mirada Switcher with a sister GP35 on Feb. 23, 2007, BNSF GP30 2467 (upper left) pauses at the Fullerton, Calif., depot as BNSF ES44DC 7701 passes with a westbound stack train. On the eve of its Motor City debut, the original GP30, EMD 1962 (left), rests backstage at Warren, Mich., on Oct. 17, 1961.

Reading in Reading. Carrying its old Conr road number, Indiana Northeastern 2185 (l works at Reading, Mich., on April 27, 2006 of the oldest GP30 survivors, the 2185 was in July 1962 as Reading 5517.

Steve Glischinski

Don't look now, but the GP30 is considered a museum piece, and more than a dozen have been preserved. Few look better than the Lake Superior Railroad Museum's Alco-trucked SOO 700. Working an excursion on the North Shore Scenic Road, No. 700 poses with restored SOO FP7 2500A on the Little Sucker River trestle at Palmers, Minn., on Sept. 10, 2006.

to react to being one-upped in horsepower by 500, hence the "30" model designation, with a trumped-up list of "30 improvements" as the excuse, even though it could only manage 2,250 hp at the time. With "GP30," EMD abandoned, for the duration, logical diesel model designations. The cowling was just a façade — literally.

I lived in the Detroit area in fall 1961 when the GP30 was introduced. In fact, our late rail photographer friend Emery Gulash, a career GM engineering manager at Fisher Body, tipped us local fans off when the prototype unit showed up from La Grange at GM's Tech Center across town up in north suburban Warren. We went up and shot it over the fence on Oct. 17. It was then put under wraps for an invitation-only introduction the following day. My late father, John, an official with the Detroit, Toledo & Ironton, was invited to the "debutante's debut," and duly recorded on film GP30 No. 1962's official entrance to society. We thought she'd break the paper curtain backward (long hood first), but slides reveal that GM was savvy enough to turn the unit around somewhere during the night, from facing north to facing south.

In 1968, the late Don Dover, editor of the fledgling locomotive news magazine *Extra 2200 South* that he and his family had just taken over from founder (and *Diesel Spotter's Guide* author) Jerry Pinkepank, credited the GP20 and, especially, the GP30 for helping launch new interest in locomotives ... and railroading. In an early issue, Don observed that, "The combination of the low-nose and new, bright and dominant paint schemes exuded more personality than Geeps ever had possessed before. Some laymen started to notice locomotives for the first time and, possibly, an untold number of young people became railfans because of this new combination. It might be said of the GP20, 30 and other contemporary models that they helped usher in the modern era of rail transportation."

The attraction certainly has not waned. Today, there are a few hundred GP30s still around. BNSF Railway, with fleets from both merger partners, is the runaway leader and the only Class I with an operating GP30 fleet. BNSF's remarkable collection includes about 75 GP30s from Santa Fe, which rebuilt them, in-kind, in the early 1980s. There are also 46 from Burlington Northern, products of 1988-1991 rebuild programs by EMD and Morrison-Knudsen. They still look like GP30s on the outside, but they're GP39-2s on the inside. BNSF 2800-2834 were done by M-K, while BNSF 2740-2750 were turned out by EMD. The EMD program included 18 more GP30s, former Southern units with high-short hoods. These units lost their "brush-back" look as EMD replaced the cabs and noses in the rebuild process. Today, they're

William D. Miller

A sheep in wolf's clothing, CSX GP30 slug 2254 (above) hammers the diamonds at Deshler, Ohio, leading southbound train D743, the Lima Local, on May 4, 2006. Fresh paint and good looks belie the fact that the 2254, built as GM&O 524, long ago lost its 567 engine, and the current drawn by its traction motors is supplied by GP40-2 mother 6488, hard at work behind.

Under threatening skies, Cimarron Valley GP30s 3023 and 3004 run around their train at Saunders, Kan., on the Colorado state line on March 1, 2006. Hauling grain on the former Santa Fe branch, the Rio Grande veterans will return to CVR's home base at Satanta, Kan.

BNSF 2751-2768. Cores for the BN rebuild program included GP30s from the pre-merger fleets of CB&Q and GN, as well as units of ACL, C&EI, L&N, NKP, SAL, Southern, SP, Cotton Belt, and UP heritage.

Other GP30 survivors earn their keep on short lines and industrial operations across the nation; from ex-Santa Fe and CSX units on Idaho's Bountiful Grain & Craig Mountain (operating a portion of the former Camas Prairie) and Conrail veterans on the Eastern Idaho, to Cimarron Valley's former Rio Grande GP30s on grain lines in Kansas, Conrail-castoffs on Indiana Northeastern, and CSX retirees working the Florida stone operations of Conrad Yelvington.

Sheep in wolves' clothing are 61 CSX GP30s converted to road slugs between 1988 and 1991. Their stylish looks are unchanged, but their 567 engines are long gone; their hoods have been sealed and their traction motors draw current from their GP40-2 mother units with which they always lock couplers.

In contrast, there are some GP20s and GP35s still at work, to be sure, but no one says much about them. Whether the GP30s were out and about in a world of GP9s and F units, or SD40-2s, or today's SD70M-2s and kin, the unique looking 1962 model has always stood out. Just like those 1959 "flared-wing" Chevys people fawn over at classic ca shows, EMD's 1962 hunk of Detroit Iron seemingly will always remain an attention magnet. I

Saving the Last U-Boat

By Andrew Kromer

They say timing is everything. Good timing — and an aggressive, proactive approach to preservation — proved to be the salvation of Providence & Worcester U23B No. 2203, the last domestic Universal-series locomotive built by General Electric.

Carrying serial number 41593 on her GE builder's plate, the historic locomotive was turned out of Erie in June 1977 as Conrail 2798, the last of a 10-unit U23B order that constituted Conrail's first purchase of new locomotives. There was no fanfare as GE delivered the last of the "U-Boats," a legendary line of domestic General Electric locomotives that evolved from the groundbreaking U25B to the 3,600-h.p., six-motor U36C and sold more than 3,100 units over a quarter century.

For 14 years, the 2798 labored in anonymity on the Conrail roll. Retired in December 1992, she was sold to the Providence & Worcester Railroad along with six other U23Bs from the same Conrail order. Renumbered P&W 2203, she was converted from GSC drop-equalizer trucks to the then-standard GE FB2 trucks and received a moderate amount of preventive maintenance work that would keep her running faithfully for another 10 years.

Hauling everything from mixed freight to stone trains, 2203 and her six sisters, along with a trio of former L&N U23Bs acquired from CSX, would prove to be the backbone of the P&W fleet for nearly a decade. In 2002, P&W began retiring its U23Bs in favor of lease-returned LMX B39-8s. One by one, the old U-boats were dispatched to Susquehanna Locomotive & Railcar Services, in Utica, N.Y., where their cab signal equipment was removed for installation in P&W's new B39-8s.

The 2003's turn came in June and the tired U23B was shoved behind the Utica shop to await its fate.

In October 2002, volunteers of the Railroad Museum of New England became aware of 2203's status at Utica and expressed interest in preserving it. Upon inquiry, Susquehanna Locomotive & Railcar Services, the locomotive's new owner, proved sympathetic to our cause, and made us an offer that we couldn't refuse — a price established at about less than half the market value of the locomotive at that time.

As is often the case in preservation efforts, a small group of museum members dug deep into their pockets and quickly raised the not-insignificant sum to save the locomotive. The timing was right. In 2002, the used locomotive market was saturated with old GEs and prices were low. Since then, power shortages have revived the used locomotive market. In fact, all of the other P&W U23Bs turned in on B39-8s have found new employment on the Susquehanna and other operations in the Northeast. Had the members of the museum waited rather than acting quickly, 2203 would have most certainly been sold or leased and put back to work.

Instead, the historic locomotive has found a new home on the Railroad Museum of New England's Naugatuck Railroad, a former New Haven branch between Waterbury and Torrington, Conn. Joining the Naugatuck's restored New Haven RS3 No. 529, U25B No. 2525, and ex-Boston & Maine GP9 No. 1732, the 2203 was in service by June 2003 and quickly became a regular on Naugy's weekend excursion trains between Thomaston and Waterbury.

In the past four years, the museum's loyal band of volunteers has done a

Carl F. Weber

Just two years old, and dressed in her original Conrail blues, U23B 2798 leads sister GEs into the curve at milepost 128.9 near Chester, Mass., on the former Boston & Albany in June 1979.

Scott A. Hartley

Safe at home. Author Andrew Kromer (right) poses with Providence & Worcester 2203 just after its arrival at the Naugatuck's Chase Yard in Waterbury, Conn., on April 27, 2003. Still in P&W paint (above), but adorned with a New Haven-inspired Naugatuck logo, 2203 pauses over the road's namesake river with an excursion train at Waterbury in June 2006.

substantial amount of work on the locomotive. They've installed a standby onboard-heating system to keep the engine warm for winter service and performed significant repairs, such as replacing of a damaged camshaft segment, changing a defective cylinder, replacing a failed oil cooler, and rebuilding the equipment-blower driveshaft.

There's much more work to be done. Additional repair and clean-up of the diesel engine is needed to get it running in top-notch condition. We also hope to someday replace the 2203's current FB2 trucks with standard drop-equalizer trucks, commonly known as AAR Type B. Finally, a complete cosmetic overhaul is needed: repairing battery boxes and other corroded carbody steel and finishing up with a fresh paint job. Although there's been no final decision how she'll be painted, a New Haven Railroad-inspired scheme and Naugatuck Railroad lettering should be a safe assumption. She'll also get back her original road number.

For now, the last U-boat lives on in weekend excursion duty, pulling a trio of the Naugy's ex-Canadian National heavyweight coaches. Not exactly the rough service she experienced during h days on Conrail or the P&W, but a ver fitting retirement for an old workhorse.

PhotoSection

Climbing Nebraska's famed Crawford Hill with eastbound Powder River coal, BNSF ES44AC No. 6070 passes above its own SD75 and SD60M helpers as it grinds through Breezy Point on Oct. 20, 2006.

Photo Section

At sunset on April 28, 2007, UP SD70M No. 4366 leads coal empties west of Beaver, Iowa.

All photos Keith Burgess

In the harsh beauty of the Arizona desert, BNSF Dash 9-44CW 4013 (above) leads an eastbound stack train near Haviland on the morning of April 11, 2006. Heading into the morning sun, UP SD70M No. 3917 (right) works an eastbound mixed freight near Desert, Utah, on Oct. 12, 2006.

Photo Section

Jeff Terry

Veteran passenger haulers find freight work. Freshly attired in Peoria & Western paint, former Algoma Central FP9s 1750 and 1752 (above) cross a wooden overpass on the approach to Lahope, Ill., on April 19, 2007. At Lahope, (right) crews tend to the aging Fs, both originally built to haul passengers for Canadian National, and now assigned to freight duty on trackage once part of the Toledo, Peoria & Western.

Steve Smedley

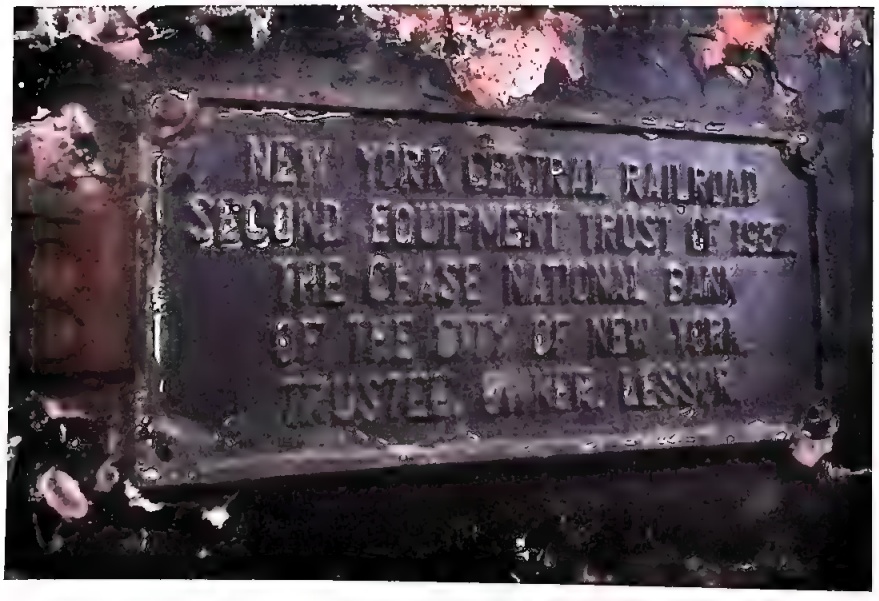
Casey Thomason

North meets South. Georgia Southwestern's Canadian-built FP9s 6308 and 6302 roll a trainload of logs past a stately trackside residence along the former Central of Georgia R-Line at Hamilton, Ga., on May 29, 2007. The GSWR pair, acquired from VIA in 2002, are of Canadian National pedigree and hauled passengers north of the border for 45 years before migrating south. Built as CN 6508 and 6521, they were transferred to VIA in 1978 and received their current road numbers when upgraded to Dash 2 specifications in 1983-84.

Photo Section

Both photos Jeff Mast

Its copper mining fortunes long ago played out, the Nevada Northern Railway these days bills itself as a "full functional historic railroad museum." The line is best known for its operating steam locomotives, but the road's Ely, Nev., shop secrets a mother lode of diesel treasures, including an 8-stack Baldwin VO1000, an S12 of New York Central heritage, and an Alco RS2 and RS3. On a February 2007 morning, VO No. 801, turned out of Eddystone in 1942, and RS3 No. 105 slumber in the shop while coal smoke from sisters under steam hangs in the rafters. Cast-iron trust plate (right) betrays the NYC origin of former Kennecott Copper S12 No. 802.


NEW YORK CENTRAL RAILROAD
SECOND EQUIPMENT TRUST OF 1952
THE CHASE NATIONAL BANK
OF THE CITY OF NEW YORK
TRUSTEE, UNDER LEASE

Both photos Jeff Mast

The golden glow headlight of Nevada Northern RS2 105 (left) greets the grey winter dawn as the 1949 Alco switches the yard at Ely on Feb. 11, 2007. Snow clouds brood above the Steptoe Valley as Nevada Northern RS2 No. 105 and sister RS3 No. 109 (below) lead a photo freight on the old Adverse branch on Feb. 9, 2007. The train represents local traffic on the branch, which once served the smelter at McGill, hauling copper ore and everything needed for the smelting process.

Riding Cadillac Style

By Ray Weart

When Wisconsin Central acquired its fleet of 110 SD45s, — ferocious, flared-radiator, 3,600-hp beasts of the 1960s — they were in rough shape, but the craftsmen at Fond du Lac and Stevens Point, Wis., shops turned them into true Cadillacs. I know. I hired out on WC in August 1992 as a conductor at Schiller Park, Ill., and was promoted to engineer January in 1996. From Day 1 until the time Canadian National retired them, I had the privilege to ride and operate nearly every one of these units; they were backbone of the WC road locomotive fleet.

They ran like Caddys — not initially, but with some tinkering. Beginning in 1993, shop forces rewired the units, and installed EM2000 processors and Q-Tron after-market traction-control computers. Initially, when the Q-Trons detected wheel-slip, they would drop the engine's electrical load to nearly zero amps — essentially rendering the engine to uselessness. I learned that the hard way, stalled on Byron Hill, the mainline's ruling grade, just south of Fond du Lac. After a little tweaking and teething, the units became formidable road power ... better than a lot of power running on Class Is at the time. The SD45s became the envy of many other crews in the Chicago terminal district.

That was for good reason. They were Cadillac plush with cloth, high-back reclining seats; big ice coolers; hard-rubber anti-slip floors, and the wonderful David Clark radio headset systems that plugged into outlets on each side of the cab. We could talk in a normal voice and hear the radio as well as if we were sitting in a living room. And they could pull.

The last time I ran a WC SD45 was June 30, 2006, working CN Train A41231-27 to UP Proviso Yard with WC SD45 No. 7519 leading Illinois Central SD40-2 No. 6130. Six months later, they were gone. In a fitting end to an era, two of the last units, Nos. 7514 and 7532,

Ray Weart

Only weeks from retirement, WC SD45 No. 7581, built in December 1966 as Santa Fe 1865, rests at CN's former-IC Woodcrest shop in Homewood, Ill., on Feb. 22, 2006.

Ray Weart

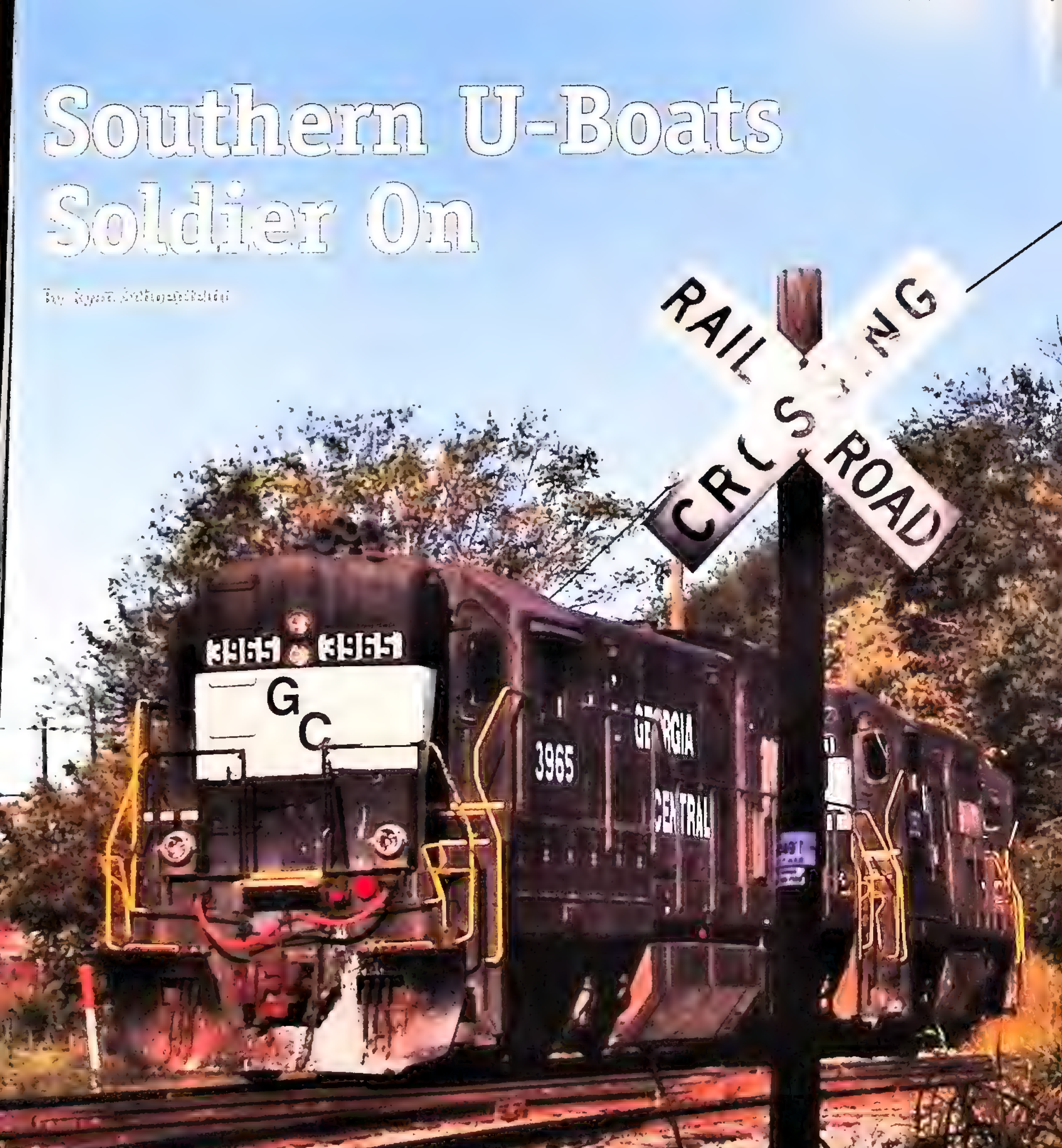
Working familiar WC turf on Jan. 25, 2006, SD45 No. 7638 (above) leads CN train M33681-25 past Deval Tower at the UP diamond in Des Plaines, Ill. Author and locomotive engineer Ray Weart (right) at work aboard WC SD45 No. 7530 on the Indiana Harbor Belt at Franklin Park, Ill., Nov. 5, 2005, on train A54391-05.

spent their final days in their old home territory, on the WC in middle Wisconsin working long-distance locals and secondary trains. Their glory days of handling important time freight trains or "Core Trains" as they are called in CN, were long over. But once, not long ago, they were real luxuries to the crews that came to know them so well. 1

Tony Ponce

Southern U-Boats Soldier On

By Kevin Smith



Thirty years have passed since General Electric closed the books on domestic Universal-Series locomotive production, and of the thousands that were built, few remain in active service today. With the passing of each year, the survivors become more and more difficult to find, but deep in the heart of Georgia, a contingent hangs on. On Georgia Central's 174-mile Macon-Savannah line, the quaint towns of Macon, Vidalia, and Savannah play host to their own diesel drama, as some of the last places to listen to the sweet melody of burbling and chortling U-Boats in regular service.

Basking in the autumn sun (left), a trio of Georgia Central's distinctive high-nose U23Bs wait on their Norfolk Southern connection at Macon, Ga., in Sept. 2004. Heading up the Vidalia local (below), the Southern veterans wheel GC Dublin-bound tonnage at Fitzpatrick, Ga., on the one-time Seaboard Air Line main.

Tucked quietly away in Georgia Central's diminutive Macon yard, three of the road's 18 active U23Bs relax under the cover of darkness. Posed beneath a solitary street lamp, the eerie sodium vapor glow highlights the locomotives' classically smooth lines, high short hoods, and rounded bodies. As the September sun struggles to reach the horizon, the yard office door swings open and three crewmen exit, stepping toward the waiting trio. They clamber about the silent U23Bs, thoroughly inspecting every inch of their worn exteriors, checking gauges and flinging hood doors open, awakening the aged FDL12 prime mover residing beneath their black and white exterior. Soon plumes of white smoke belch skyward, hood doors rattle, and the earth shakes. The unsettling racket calms into a repetitive burble — an almost melodic chant — and the U-boats and crew begin their day. With the sound of FDLs reverberating off the Georgia pines, crew and locomotives put on an impressive display of sight and sound, methodically assembling their outbound train to Dublin and sorting local interchange traffic for the Norfolk Southern.

Upon their retirement from Norfolk Southern, Georgia Central picked up the group of 18 former Southern U23Bs in the mid-1990s in an effort to replace a tired fleet of former CSX U30Bs and U36Bs. Today, all remain active with the exception of one: The 3907 is used as a parts donor, sacrificing itself for the GC's common good. In addition to the former Southern units, a single U23B of L&N and CSX heritage has joined the roster. Their days of hauling the freight of a Class I over, these Southern Railway veterans have found favor in the eyes of the Georgia Central, moving Kaolin clay and forest products on its former Seaboard Air Line Macon-Savannah main line. 1

Both photos, Ryan Schoenfeldt

Fighting Snow at Fifty

Story and photos
by Greg McDonnell

icicles clinging to her port-holed carbody, a delicate dusting of snow highlighting her classic lines and sculptured bulldog profile, RaiLink FP9 1401 shudders in the cold on the Goderich-Exeter at Clinton Junction, Ont. On a blustery February 2007 morning, just weeks shy of her 50th birthday, the ex-VIA cab unit is assigned to snowplow duty along with younger sister 1400 and GP9 4001, a late-model '9 with a factory low-nose and Southern Pacific pedigree. This is an unlikely trio to lock knuckles with an ancient wedge plow deep in the southwestern Ontario snowbelt: a pair of cast-off passenger haulers and a California girl a long way from home.

Most of the Fs left operating today survive by virtue of their good looks or historic worth ... not on the Goderich-Exeter.

Shortline railroading, though, makes for strange bedfellows.

The Canadian National parentage of RLK 1400 and 1401 — outshopped from the London Ont., plant of General Motors Diesel as CN 6539 and 6523 in July 1958 and March 1957, respectively — is evidenced by the high-mounted bells sported on the fireman's side of their cabs. Lettered for RaiLink's northern Alberta Lakeland and Waterways, GP9 4001 is less obvious about its heritage.

The youngest member of the three, the 48-year-old Geep rolled out of EMD's La Grange plant in summer 1959 as SP 5872.

For the most part, the aging units have retained their as-built appearance, but all have benefited from rebuilds and internal enhancements; their original 567s have been replaced with upgraded 16-645C prime movers and their electrical systems have been modernized. The FP9s were among 15 VIA cabs given extensive rebuilds and 6300-series road numbers by CN shops in the mid-1980s. The former VIA/CN 6539 rolled out of Pointe St. Charles in Montreal as VIA 6303 in February 1984, while 6523 emerged from CN's Moncton, N.B., shop as VIA 6312 in December 1984. Retired as SP 3708 in 1990, the 4001 migrated north to the Central Western Railway in Alberta in 1992 and was rebuilt for RaiLink by Boise Locomotive in 1998. As locomotives go, even their upgrades are old. And they're about to be pushed to the limit. Shoving the plow into the fury of a textbook "lake effect" squall that has held the snowbelt in its grip for days, the geriatric GMs — and the storm-weary railroaders in their company — have a huge task ahead of them.

The mercury is pushing 20 below. The wind, strong enough to mandate windchill warnings cautioning that exposed flesh could freeze within minutes, is piling up drifts of four, six, and more feet deep, filling in cuts, burying switches, and keeping men and machines working around the clock in a heroic effort to keep the GEXR a half-step ahead of Mother Nature. This is no place for the timid.

Thirty six cylinders of EMD power bellow out as FP9s 1400 and 1401, along with former-SP GP9 4001, shoulder 1937-built plow 55413 into the hard-packed snow of Mustard Cut, just south of Brucefield, Ont., on Feb. 8, 2007.

In the cupola of snowplow 55413, the plow foreman peers into the blizzard through the frosted windows of an old battleship of a car riveted together by the Trenton, N.S., works of Eastern Car in spring 1937. The former-CN plow rides like a bucking bronco, and holds the track about as well. But, with a fearsome V-shaped plow equipped with a moveable flanger blade for a lower jaw, and a pair of air-operated wings to push back the snow on both sides of the track, a more efficient and effective snow-fighting machine has yet to be invented ... and probably never will.

With a rush of air and a heavy metal clunk, the battered steel wings push open as the plow prepares for battle. "OK to head east on the plow," the foreman radios to the power. Brakeshoes release their icy grip on snow-rimmed wheels. A hand tugs at the throttle of an aging FP9 and 5,350 GM horses charge into the storm.

If the venerable wedge plow is the most effective piece of snow-fighting equipment available to snowbelt railroaders, there's no better locomotive to couple behind it than an F unit. And that is what prompted RailAmerica to transfer its two FP9s from northern Alberta to join the rag-tag fleet of hand-me-down GP9s, GP35s, GP38s, GP40s, and leased LLPX GP38-2s on the Goderich-Exeter in winter 2003.

For the faithful, the return of the F unit to this most spectacular winter theater is nothing short of a miracle.

It wasn't that the cab units were any better suited for day-to-day freight service on GEXR's 172 miles of ex-CN secondary main and branchline trackage radiating from Stratford. Indeed, GEXR crews prefer to marshal the Fs as middle units whenever possible, and the old cabs make most of their miles trudging between Goderich and Stratford with trains of salt and grain. For much of the year, they're low-priority power: first to be laid-up if tonnage drops, last to be repaired if they go lame. However, the same streamlined carbody that makes the units undesirable for switching makes them ideal for snow-fighting. They shrug off the snow and ice that accumulates on the open gangways and stubby noses of hood units, filling in step wells, blocking cab and hood doors, and making access to the cab and engine difficult, or even impossible. When winter takes hold in southern Ontario and lake effect snows blow in from Lake Huron, the GEXR Fs come to the fore.

Most of GEXR's Goderich-Stratford and Clinton Junction-Centralia mileage is spiked through the heart of the southwestern Ontario snowbelt, where headlight-high drifts are common, and heavily drifted sections can be measured in miles; where snow-filled cuts named Mustard and Ward's can still strike fear in the hearts of railroaders. West of Stratford, the road's Georgetown-London main also slices through snowbelt territory where, even in the moderate winters of recent years, drifting has been heavy enough to stall and strand VIA passenger trains using the line.

RailAmerica's decision to assign Fs to the Goderich honors a practice the CN

Speed reduced to a stall-threatening crawl, FP9s 1400 (left) and 1401 (above) struggle through porthole-deep snow at Mustard Cut. Built to wheel Canadian National passengers at 90-plus miles per hour, the veteran cabs take to the business of waging battle with blizzards and plowing snow as if they were born to it.

roundhouse staff at Stratford initiated 30 years ago. In winter 1977-78, the roundhouse crew managed to convince CN management to transfer F7As 9178 and 9179 from western Canada to Stratford for winter duty in the snowbelt. Thus began an annual winter migration of CN Fs to Stratford for snow service. The tradition continued until CN retired the last of the 9100s in the late 1980s. When the final F7s left Stratford in spring 1989, there was every reason to expect that the glory days of drift-busting cab units were gone for good.

The roundhouse, the 9100s, and most of the legendary snowbelt branches out of Stratford *are* gone for good. The roundhouse has been torn down and the branches to Palmerston, Southampton, Kincardine, and Owen Sound, abandoned and torn up by the early 1990s. No one could have dreamed that the RailTex (now RailAmerica) takeover of the CN Goderich and Exeter Subs in spring 1992, and the Georgetown-London Guelph Sub in 1998, would set the stage for an eventual return of the F unit to this most spectacular theater of winter railroading. But it did.

For the faithful, it's nothing short of a miracle. For the railroad, it's a simple matter of applying motive power resources where they're most effective. For those fortunate enough — some would say foolish enough — to find themselves within striking distance of the squall lines when the winds are up and the GEXR plows are called, it's well worth the wind-chill, white-outs, and white-knuckle miles on

Prepared for battle, late-model GP9 4001 and FP9s 1400 and 1401 (above) head into the full fury of a lake effect squall as they depart Clinton Junction, with an eastbound "Plow Extra" on Feb. 6, 2007. Draped in ice and packed with snow, FP9 1400 (left) keeps hold of the plow at Hensall on Feb. 8, 2007.

drifted roads to witness a couple of old passenger cabs putting on the performances of their lives.

Fighting westward on the Goderich Sub near Sebringville, the two Fs and their GP9 companion shove hard on the old black plow as they buck through drift after deepening drift. Successive explosions of snow erupt as the plow smashes through near-continuous drifting, stirring up a blizzard of its own and advancing across the frozen landscape in a furious tempest of flying snow, howling diesels and blaring horns.

Forget the wind and cold and risk of frostbite. This is winter railroading at its breath-taking, adrenalin-pumping best. As Bachman-Turner Overdrive's Randy Bachman once stuttered, though, "you ain't seen nothing yet." The plow's orders for the day include a side trip from Clinton Junction to Centralia, end-of-steel on the 24-mile Exeter Sub.

Six drift-busting miles south of Clinton Junction, Mustard Cut broods in the low afternoon light. A long, deep, snow-filled slash in the rolling farmland near Brucefield, Mustard has claimed its share of trains over the years. Locals and veteran railroaders tell of trains and plow extras stalled in the notorious cut, sometimes for days; some extricated by rescue plows, others dug out by hand.

The relentless wind blows hard off Huron. Snow sifts across the frozen fields and drifts ever deeper in the cut. Handicapped by speed restrictions on the wobbly rails of the lightly trafficked branch, the plow closes in on the cut at less than half of the speed once demanded by plow foremen of old. Advantage Mustard.

The plow rocks unsteadily through the long sag on the approach to the cut, smacking a string of small drifts as it goes. The air horn calls out for the Staffa Road crossing and echoes in the cold distance. The plow foreman draws in the wings for the attack and calls for more horses. Thirty six cylinders of EMD power sing out in response as the plow slices into the hard-packed snow.

A massive eruption of snow — from boulder-like chunks to a wild blizzard of powdery white — envelops the train.

Silhouetted in the late afternoon sun (above), the southbound plow kicks up a storm passing an old windmill along the Exeter Sub south of Hensall. Ice clings to the flanks of RLK 1400 (right) at Hensall, Ont.

Within feet, speed is reduced to a stall-threatening crawl as Mustard brings the plow to its knees. The engines dig in. The guttural two-cycle throb of normally aspirated EMDs overwhelms the senses as the engineer summons every ounce of available horsepower from his elderly steeds. Somewhere beneath the snow, D77 traction motors — miraculously resisting ground relays — guzzle all the amperage they can get, and steel wheels somehow keep a grip on icy rail. The plow churns onward, gaining ground inch by excruciating inch. The three units struggle to keep moving. With a few miles per hour to spare, the plow punches out of the south end of the cut and the engines throttle back. Victory is theirs.

Draped in ice and packed with snow, a half-century of service and incalculable millions of miles are under their belts; a world removed from the heady passenger days of their youth, and a decade after VIA declared them redundant, the Fs head triumphantly toward Centralia. Its doubtful that the men at GMD had this in mind when they bolted and welded the FP9s together on the shop floor at London and dressed them for the passenger trade in glossy coats of CNR green, black, and mustard yellow.

Certainly, these veterans of wheeling the likes of the Super Continental and Panorama cross country, racing Rapidos from Toronto to Montreal and Quebec City, and fulfilling the time-carded commitments of generations of CN and VIA passenger trains are out of their element slugging salt and grain on the Goderich. Yet, they take to the business of waging battle with blizzards and plowing snow as if they were born to it.

After all these years, the "P" in FP9, it seems, might just as well stand for plow as passenger. ▮

HOW APPROPRIATE

Norfolk Southern dresses its new show horses in tuxedos

By Jim Wrinn

Robert E. Brzostowski

"As right as hushpuppies on the plate with chopped pork barbecue and coleslaw on the side for dinner," Tuxedos and Tuscan heavyweights roll through the hills of Virginia as the homeward Masters special curves through Happy Creek on Southern Railway turf. Strolling through the streets of Augusta, Ga., in A-B-B formation (above right), Tuxedo painted NS Fs Nos. 4270, 4275 and 4276 — accompanied by GP38-2 5646 pinch-hitting for F7A 4271, still in the shop — cruise 6th Street on March 30, 2007 with Norfolk Southern No. 951, the road's office car special to the Masters Golf Tournament.

We will remember 2007 for a lot of meaty locomotive news. General Electric showed off its much anticipated hybrid test unit. Genset switchers flooded the country in search of greener pastures. MP36s dominated commuter lines. But if this year has one landmark moment that is about grace and beauty it may well be remembered as the year Norfolk Southern, which calls itself the Thoroughbred of Transportation for good reasons, put a tuxedo on its newly acquired executive units — show horses, if you will. And this newly acquired herd never looked better. Well, except for their Southern Railway predecessors.

You see, Norfolk Southern's units — a perfect A-B-B-A set of classic EMD F units — wear what today is a special paint scheme. To those of us who grew up in the South in the 1960s and 1970s, it is a familiar look on a familiar face:

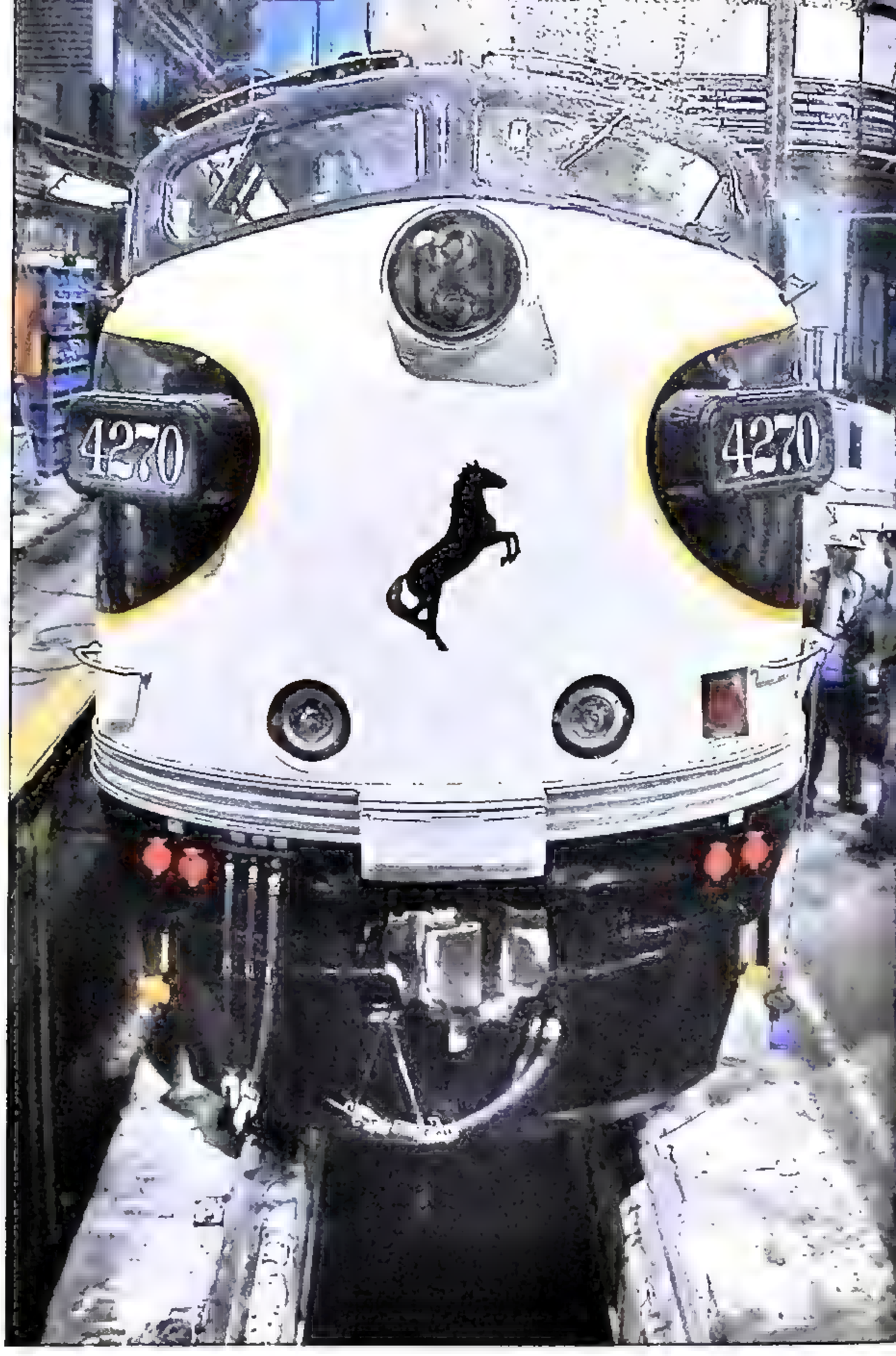
Casey Thomason

Southern Railway's traditional black and aluminum body set off with gold stripes on the sleek, smooth carbody of a cab unit — a classy tux for a classy railroad. Last spring, when the first three units rolled out of the NS shop at Altoona, Pa., it was like going home to a grand era 40 years ago — a time when Southern was laying welded rail while other railroads were waddling down weed-grown tracks with broken rails and low joints; making money while other railroads were going bankrupt; and doing all this with a management that liked being railroaders while others went off to try mixing railroading with telecommunications or soft drinks.

Make no mistake. These are not Southern units — they have "Norfolk Southern" spelled out on their sides. The rearing Thoroughbred emblem rides the nose of the two A-units where the round Southern emblem would have been. But the image that these units project is of a railroad that is in touch with a rich heritage — the office cars they haul have been Norfolk & Western Tuscan red now for 23 years — while keeping with the times.

Its somewhat ironic that the pedigrees of the 1950s-vintage units, acquired from Kansas City Southern in fall 2006, are as diverse as they are: None of the four belong to any NS heritage road and only in recent years did they live the cushy life of passenger units. For many years,

Norfolk Southern



Greg McDonnell

Tuxedo transformation of NS 4270 is well under way (left) as crews prepare the primered F9A, still carrying RailCruise America 1010 number boards, for paint at Juniata. Neatly attired in her newly applied Southern-inspired Tuxedo, 4270 receives last-minute attention in the Juniata Test Shed on the April 24, 2007, eve of her trip to the Kentucky Derby. At far right, Juniata workers prepare to install 4270's new number boards.

they lugged coal in the Appalachians or dragged grain out of the Midwest.

Norfolk Southern 4270 started life as Baltimore & Ohio F7A No. 937. She was rebuilt into an "F9PH" commuter engine for Maryland Department of Transportation in 1980 and plied home rails between Brunswick, Md., and Washington, D.C. Sister 947, now 4271, followed a similar route. RailCruise America acquired both units for its luxury excursion trains that roamed the Midwest out of St. Louis. The B-units reflect Midwestern roots: 4275 started out as Chicago Great Western 113D; and 4276 began life as CGW 114B; both units wound up in executive train service for CGW successor Chicago & North Western, and when Union Pacific took over C&NW in 1995, the two found new jobs at RailCruise America.

After KCS bought the RailCruise America train for its office cars, it declared the cab units surplus — the Route of the Southern Belle has its own executive Fs, thank you, and that was when NS Chairman Wick Moorman decided to bring them into his road's stable. Acquiring the units for executive train duty does, after all, free up road units to pull money-making freight trains. It also follows Southern wisdom to put the right engines to work on the right trains — remember in the early 1980s when three GP50s always powered intermodal trains, three SD40-2s tackled merchandise trains, and four four-axle units handled everything else? That was good motive power managers at work. Moorman, who grew up in Hattiesburg, Miss., on the Southern main line, and came up through the ranks in Southern's management trainee program in 1970 after graduating from Georgia Tech (in SR's operating headquarters city, Atlanta), knew how he wanted them to look — just right. "I remember seeing that paint scheme when I was growing up and noting how attractive it was," Moorman said in an interview. But it's more than nostalgia — the scheme nicely complements the NS black and white Thoroughbred paint scheme that dates back to October 1983 — with a gold ribbon thrown in for success.

How fitting is Norfolk Southern's nod to its past in its new executive train power?

Norfolk Southern

It's as customary the Kentucky Derby (which, incidentally was one of the show horses' first outings after an initial trip to the Master's Tournament in Augusta, Ga.). It's as right as hushpuppies on the plate with chopped pork barbecue and coleslaw on the side for dinner.

The cab unit tradition on Southern is a long and proud one. Southern purchased Electro-Motive Corp.'s FT demonstrator No. 103 — the first freight cab unit and the locomotive credited with popularizing dieselization — in 1941 and ran it as No. 6100. It was the first of almost 400 four-axle cab units on Southern and its many subsidiaries that

Heading home from the Masters, NS 4270 and companions soar above the Potomac River — and the Maryland-West Virginia state line — on a spectacular steel trestle at Shepherdstown, W.Va., on April 10, 2007.

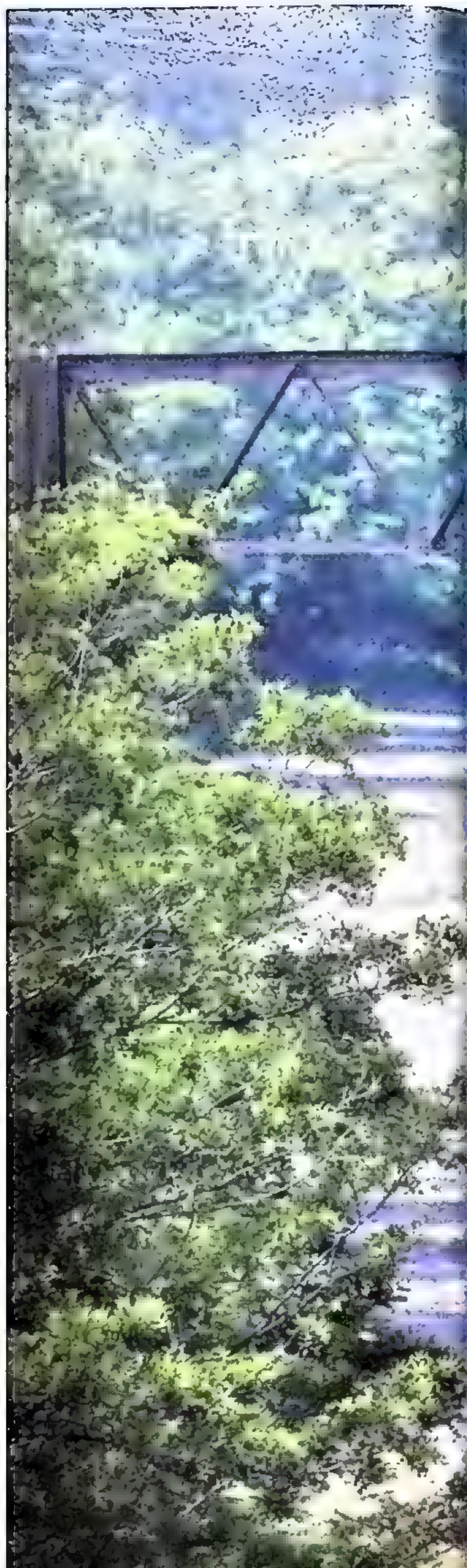
Robert E. Brzostowski

Greg McDonnell

Headlight slicing the morning mist, NS 4270 leans into Horseshoe Curve on the climb west from Altoona, leading Louisville-bound office car special 955 on April 25, 2007.

started out in Virginia green with an aluminum band with gold trim. In 1958, they went black, but did not lose any of their appeal. Among the biggest number series were the F7s in the 4200s, the last one being 4269 — one number shy of NS's "new" Fs. Southern kept its Fs busy on freight until 1974 when the last F7 was retired. A hint of what had once been remained in 20 FP7s that stayed on the roster and hauled ballast trains in the Atlanta area, while a handful took on a modernized version of the green paint scheme to pull excursions and officers' specials. The last FP7 left the Southern Railway roster in 1988.

For almost 20 years, NS was railroad of EMD and GE hood units with not a cab unit in sight. But now, look what the forces at Juniata Shops have done with these four magnificent horses. And most of all, look what Norfolk Southern has done to further bolster its image as a first class railroad. All I can say — all anyone can say is: "My, how appropriate." I



Robert A. Shook

Sprinting eastbound over the Broad Way, Fs 4270, 4275 and 4276 pass classic Pennsy position light signals at Derry, Pa., deadheading a three-car shippers' special home to Altoona on May 25, 2007.

307.5
307.5
4270
4270

ALTOONA WORKS

Norfolk Southern's Historic Juniata Locomotive Shop Excels

By Greg McDonnell

"What we do, we do well"

Lynn Ramsey, general superintendent, Juniata Locomotive Shop

In an age when the railroad-owned, heavy-repair shop has become a rarity, Norfolk Southern's Juniata Locomotive Shop in Altoona, Pa., bucks the trend. Juniata, once the main locomotive shop of the Pennsylvania Railroad, has endured dieselization, rationalization, the Penn Central merger and bankruptcy, the creation and break-up of Conrail, and — against considerable odds — thrives as one of the busiest and most efficient locomotive shops in the industry.

Steeped in more than a century and a half of history, tradition and pride, Juniata is for Norfolk Southern today, what it was for the Pennsylvania Railroad for generations. The 70-acre Altoona facility is Norfolk Southern's primary shop for heavy locomotive repairs, rebuilds, and overhauls. In fact, Juniata performs at least 95 percent of the overhauls on the NS fleet of more than 3,800 locomotives.

In the same brick shop buildings where their predecessors — in some cases, fathers, uncles, grandfathers, and great grandfathers — labored to build and rebuild Pennsy steam, from lowly 0-4-0s to legendary K4s and too-late-to-the-party duplex-drive 4-4-6-4 Q2s and 4-4-4-4 T1s, a new generation of Juniata workers minister to Norfolk Southern EMD and GE diesels. The art of setting valve-gear, sweating tires, and re-tubing boilers has given way to machining crankshafts, balancing armatures, and working with the likes laser-guided line-bores, electronic test equipment, and computerized machines of mind-numbing complexity and capability. Unchanged are the old-school work ethics and time-honored pride in a job well done that stand as cornerstones of the Juniata shop, as sure and solid as the 1888-dated slabs cemented in the red-brick walls of its oldest buildings — structures that date from Juniata's original construction.

The Juniata shop complex was planned to supplement Pennsy's original Altoona shops built in the early 1850s. Construction was begun in September 1888 and completed in 1890. The shops were expanded several times, in 1902-03, 1917-18, and 1924-25. The latter expansion included construction of the massive Engine & Machine Shop, which now serves as the A through D bays of the main shop. In June 1928, Pennsy merged all of its

Viewed from the overhead crane on April 25, 2007 (left), Juniata's Engine & Machine Shop is crowded with locomotives in various states of disassembly or re-assembly: SD40-2 No. 3357 is being torn down for repairs; in the background, RailCruise America F9A is in the midst of its transformation to NS 4271. In the Test Shed (above), workers put the final touches to NS 100, the first Juniata-built RP20BD genset switcher.

Altoona shops — the Altoona Machine Shop, Altoona Car Shops, Juniata Shops, the South Altoona Foundries, and the East Altoona roundhouse — under a single name: Altoona Works. By March 1938, the PRR had moved all heavy locomotive work to Juniata. At its zenith, Juniata could repair four locomotives per day and build 12 new locomotives per month.

Unlike so many heavy shops across the nation, Juniata survived the transition from steam to diesel. The Altoona facility held its status as Pennsy's main locomotive shop for heavy diesel repairs and overhauls, and endured through the tumultuous Penn Central years. Conrail turned Juniata's fortunes around, modernizing the facility, building a new paint shop in 1982 on the site of the Boiler Shop, which had been destroyed by fire a year earlier, and expanding the main shop by enclosing a large open-air midway to create the E bay in 1983. This was the first major new construction at Juniata since completion of the Engine & Machine Shop 58 years before. The expansion gave the modernized E&M shop a whopping 311,000 square feet (that's about 8 acres!) under roof. Including all buildings on the site, Juniata boasts a total of 960,000 square feet, or approximately 22 acres, under cover.

Viewed from the air (left), the Juniata Locomotive Shop stretches toward downtown Altoona. "Circle tracks" lead from the turntable to the 311,000 square-foot Engine & Machine Shop that dominates the foreground. The two-stall Test Shed is the first building on the left above the E&M building; the three-stall paint shop visible just beyond. The large stack marks the power plant; the long brick building on its right is the Wreck Shop. To the left of the powerhouse is the Smith Shop, whose 1889 cornerstone (above) bears testament to Juniata's longevity.

Workers carefully lower a rebuilt armature into a traction motor frame, while Tom Kissel (right) machines an EMD 16-645E3 engine on the massive Giddings & Lewis line-bore machine.

The heart of the matter

At the heart of the Juniata Locomotive Shop is an internal power plant outfitted with three coal-fired Riley boilers and two 1,875kw Westinghouse turbine generators that produce steam and electricity to satisfy much of the shop's need for heat and power. Three additional gas-fired boilers supplement demands for steam during peak periods. The remainder of Juniata's power needs are drawn from the commercial grid.

Norfolk Southern took title to the Juniata Shops in the CSX/NS Conrail split on June 1, 1999, and has maintained an ongoing modernization program. Overhaul and repair processes have been streamlined; from computer-programmed wheel-boring machines, presses and lathes, to a $17 million assembly-line-style overhaul bay for EMD locomotives. Juniata can completely overhaul an EMD or GE locomotive in six to seven working-days.

The Altoona facility has prospered under NS ownership. Productivity, efficiency, and employment levels all have increased in the eight years NS has been at the helm. When NS took over, the Conrail shop had been working one shift a day, five days a week. Juniata now operates around the clock with 19 shifts per week and currently employs about 950 workers. In 2006, Juniata shopped a total of 746 locomotives.

Lynn Ramsey, Juniata's general superintendent, knows his business. A career railroader with 39 years of service — 31 of them with N&W and NS at the Schafer's Crossing and East End Shops in Roanoke — Ramsey speaks with the authority that only can come from a lifetime of experience. He enthusiatically tells of improvements made at Juniata; of the heart-stopping accuracy of laser-guided lathes, a paint shop updated to the latest standards, and even anti-pollution equipment and scrubbers on Juniata's power plant.

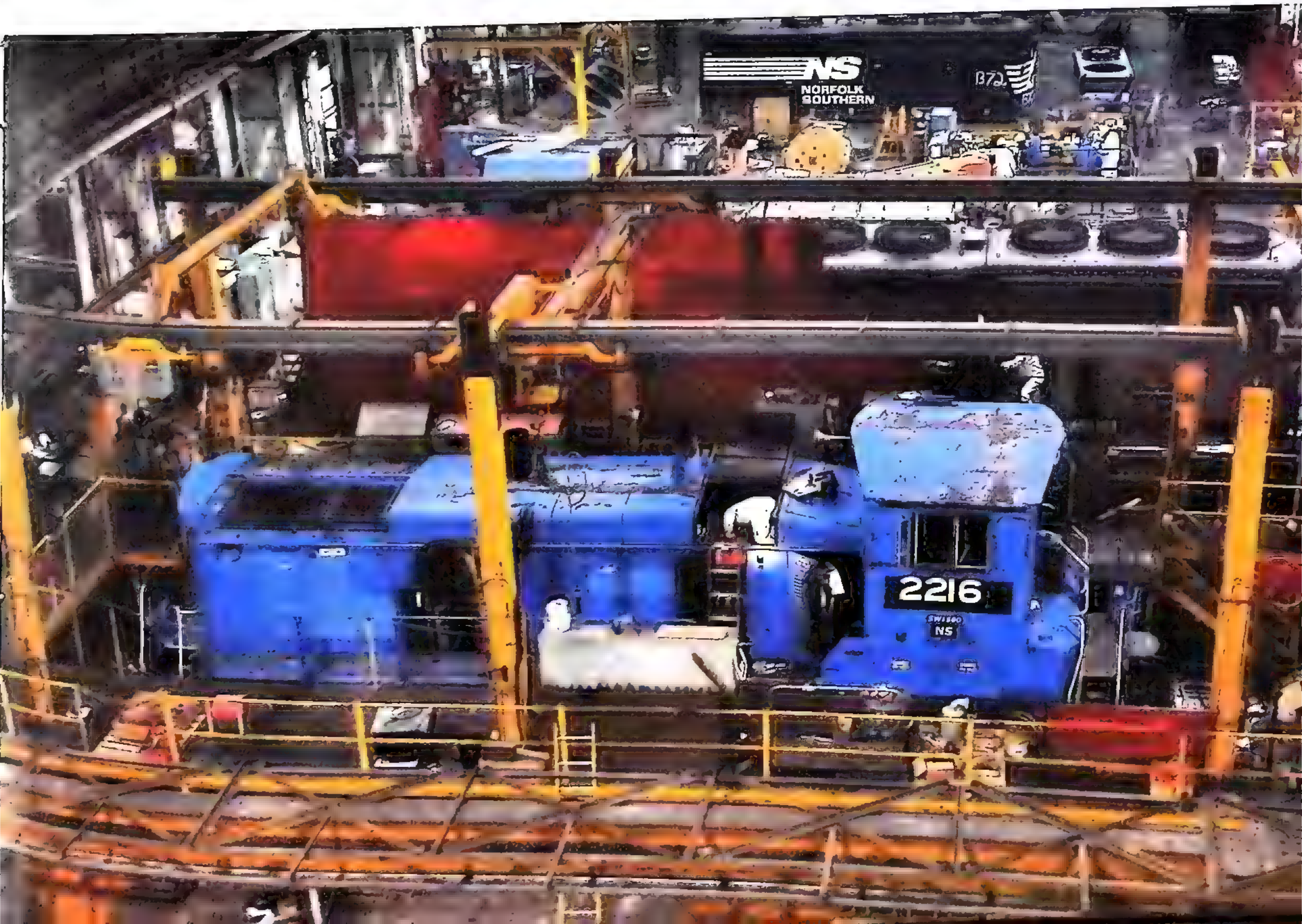
Ramsey reserves his highest praise for the workers at Juniata; a productive and efficient workforce that, in 2006, overhauled nearly 400 EMD and GE locomotives, gave mid-life overhauls to 120 more EMDs; performed capital r builds turning 42 GP38s and GP38AC to GP38-2s, and 10 GP50s to GP38-3 made over 300 truck-changes; tested, rebuilt and re-wheeled more than 6,000 traction motors; and performed contract rebuilds of at least 24 EMD

engines and several dozen locomotives from other railroads. All this took place while Juniata was winning system safety awards two years running. "We get the cream of the crop here," note Ramsey. "This is a good place to work."

"What we do, we do well," Ramsey said. And what Juniata does covers the full spectrum of rebuilding and repairing locomotives and major components from the wheels up. Locomotives are stripped to the bare frame and completely rebuilt to original standards, or higher. Traction motors, generators and main alternators, auxiliaries, air compressors, and air brake equipment are inspected, tested and reconditioned; trucks rehabbed, wheels turned or replaced; roller-bearing journals and new wheels pressed onto new axles; electrical systems re-wired and upgraded; diesel engines torn down to the bare block and completely rebuilt; crankshafts repaired, power assemblies rebuilt, cabs upgraded and finished units repainted in one of the shop's two state-of-the-art paint booths.

In-sourcing has helped boost the work load at Altoona since Conrail began marketing the shop to the outside world as Juniata Locomotive Shops in the early 1990s. These days, in-sourcing work is managed by Thoroughbred Mechanical Services, a division of Norfolk Southern.

Still dressed in Conrail blue, SW1500 No. 2216 undergoes main generator repairs, while SD40-2 No. 6179 receives attention in the next bay. GP40 hoods visible in background will be re-applied to GP40-2 rebuilds.



TMS sells Juniata's services to the industry, and in the past year, major in-sourcing contracts have included rebuilding a number of EMD 16-645E3 engines for Florida East Coast, reconditioning 200 trucks for RailPower Technologies for use in construction of RP20BD gensets, rebuilding five Amtrak units and performing finishing work and final test on 40 new EMD locomotives.

Answering the shop whistle

On a rainy spring 2007 morning, the haunting call of Juniata's steam shop whistle — a near-forgotten institution of industrial America — cuts through the morning mist and calls the day shift to duty. In the great cathedral of motive power that is Juniata's Engine & Machine Shop, the heavy-industry oratorio of singing air tools, grinding lathes, droning machinery, and the constant ringing of steel-on-steel rises to the rafters. The bays are crowded with locomotives in various states of disassembly or re-assembly: SD40-2s, GP40s, and Dash 8s torn down for overhaul; an old SW1500 in for a main generator change; an SD70M booked for computer problems and wheel defects; a Dash 9 with engine damage; a tired MP15DC for engine-change and rebuild; and an RP-E4D slug for modifications and paint.

In the A bay, crews clamber about a pair of primer-grey GP38s in the midst of a from-the-rails-up rebuild and transformation to GP38-2s. Part of a major NS capital rebuild program that has produced nearly 80-and-counting GP38-2 rebuilds, the units receive new cabs, noses, control stands, and cab air-conditioners, in addition to a complete rebuild, rewiring, and upgrade to Dash 2 specifications. The D.C. generators of older GP38s are replaced with A.C. AR10 alternators and former Norfolk & Western, and Southern units built with high short hoods and configured for long-hood forward operation receive new low noses and are set up with conventional short-hood forward configuration.

Primered and almost ready for the paint shop, R.J. Corman GP38-2 No. 3804 — rebuilt from NS GP38 No. 2756 — nears completion (above), while workers in the Engine Shop (left) reassemble a rebuilt EMD 16-645E3 prime mover.

Mike Acker inspects a GE 752 traction motor frame stripped for rebuilding. Juniata tests, rebuilds and re-wheels more than 6,000 GE and EMD traction motors per year.

Former-N&W 4100 is well on its way to becoming NS 5670, while ex-Southern 2756 will become R.J. Corman 3804 as part of a contract with Thoroughbred Mechanical Services to supply the short line operator with at least eight GP38-2 rebuilds. Just through the doorway, workers are putting the final touches on freshly painted R.J. Corman 3803, a rebuild of RJC's ex-Southern GP38 2754.

A few feet away, a welder works on the long hoods of NS GP40s lining the floor. Elsewhere around the shop, the frames of five 1967-vintage GP40s built for N&W are being stripped bare in preparation for rebuild as GP40-2s equipped as master units to operate with 4-axle road slugs. At least a dozen GP40-2 slug masters are planned. With no production-model 4-axle road units in the current catalogs of the major builders, Juniata provides Norfolk Southern's in-house solution with programs to produce GP38-2, GP38-3 and GP40-2 rebuilds from retired units. NS uses the Dash 3 designation to distinguish units built from GP50 cores that retain some 50-series circuitry and wheel-slip systems.

Amid the rows of NS-black and Conrail-blue high-horsepower hoods, a green and silver F-unit stands out. Patched with primer, retrofitted with an original-style pilot and carbody portholes, former-St. Louis Car/RailCruise America F9A 102 is undergoing a miraculous metamorphosis and will emerge from Juniata in Southern-inspired tuxedo paint as NS 4271, the fourth unit in the NS A-B-B-A executive fleet.

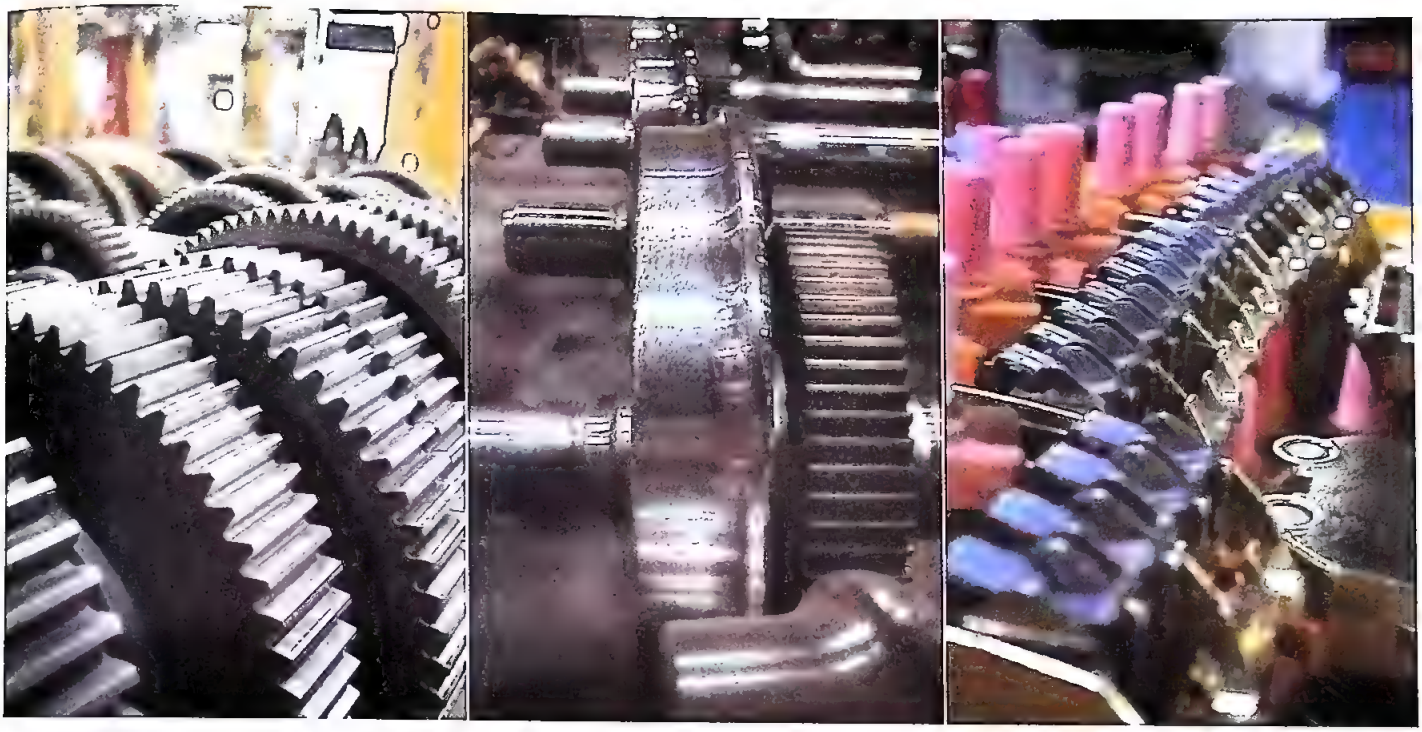
Farther up the row, workers are engaged in more routine activities, as Dash 8-40CW 8384 receives a complete overhaul. Admitted to the shop for a scheduled overhaul on April 24, the former-Conrail Dash 8 — built in April 1993 as CR 6171 — follows a ritual repeated some 400 times a year at Juniata. Prior to entering the shop, the 8384 was drained of fluids, had all filters removed, and the toilet serviced before being moved to the "circle tracks" around the turntable to await its turn on one of the GE stripping tracks in the shop.

In the strip bay, the overhaul process begins as workers remove the handrails and hood to improve access to the engine. Crews then begin removing pipes, lines and hoses connected to the engine. The batteries are disconnected and serviced

Her Conrail blue paint somewhat worse for wear, Dash 8-40CW 8384 (above) is mid-way through a complete overhaul in the E&M Shop. In the Wreck Shop (right), GP38ACs 2826 and 2854 are stripped to the frame and prepared for complete rebuild and conversion to GP38-2s. They'll emerge from Juniata as NS Nos. 5672 and 5671, respectively.

and various sensors are removed. The stripping process includes removal of all filters, crankcase covers, water-inlet and outlet headers, air boxes, exhaust manifolds, muffler, intercoolers, turbocharger, lube-oil cooler, water pump, oil pump, butterfly valve, power assemblies, crossheads, cam sections, governor, governor drive, and cam-gear cover. By the time stripping crews are finished, the engine compartment contains little more than the engine frame and crankshaft.

Before any further work is performed, the 8384 is moved to the wash bay, where the engine compartment is steam cleaned to remove dirt, oil and grease.



Traction motor gears, new wheel sets, and rebuilt electrical components (above) stand ready for installation. In the backshop (below) the overhaul of Dash 8-40CW 8384 continues as workers re-assemble the big GE's 4,000-hp 7FDL16 engine.

The procedure is more than cosmetic; it's done to eliminate any slippery conditions that could be unsafe, and to facilitate inspection of the engine frame.

Prep work complete, the 8384 is moved to the build-up track and given a thorough examination. The frame is inspected for any cracks or damage; cam gears and split-gear are checked for wear, and replaced if necessary. The lower main bearings are removed, inspected, and replaced with new bearings. Following renewal of the rubber-bonded drive, components removed from the 8384 are reapplied in reverse order to which they were removed. All components applied to the 8384 during overhaul are new, rebuilt, or cleaned and inspected. Scheduled modifications and routine maintenance issues are also addressed during the build-up process.

Reassembled and ready to roll, the 8384 is moved to the Test Shed, where the locomotive is fueled and watered, and the prime mover replenished with oil, pre-lubed, and fired up for the first time. The engine is monitored closely and bearing temperatures checked prior to a short break-in cycle, followed by a full load test. At the completion of the testing, the torque on critical components is re-checked to ensure that nothing has vibrated loose during the load test.

Under normal circumstances, the 8384 would then be booked into the paint shop. However, traffic levels demanded the unit's return to service as soon as possible. On May 1, 2007, exactly a week after it entered the shop, NS 8384 hit the road again — still dressed in Conrail blue, but feeling as good as new.

If Juniata's day-to-day role as a backshop is its most essential function, its greatest claim to fame has been that of a

Lasers and high-tech computer equipment analyze the line-bore of a 16-cylinder EMD 645 engine undergoing rebuild.

locomotive builder. The first Juniata-built locomotive, Pennsylvania H3a 2-8-0 No. 692, was outshopped in July 1891. During the next 55 years, more than 4,600 more Juniata-built locomotives — steam, electric, and even a few gas and diesel-powered models — would follow the 692 out the shop's iron gates.

Steeped in history

Some of the most legendary locomotives of American railroading have carried Juniata Shops or Altoona Works builder's plates; from PRR's famed E2 Atlantics to massive I1s 2-10-0 "Hippos," Consolidations and Mikados by the hundreds, M1a Mountains and wartime J1 class 2-10-4s, not to mention some of the most famous Pennsy power of all: 350 K4s Pacifics and 124 of the road's renowned Loewy-styled GG1 electrics.

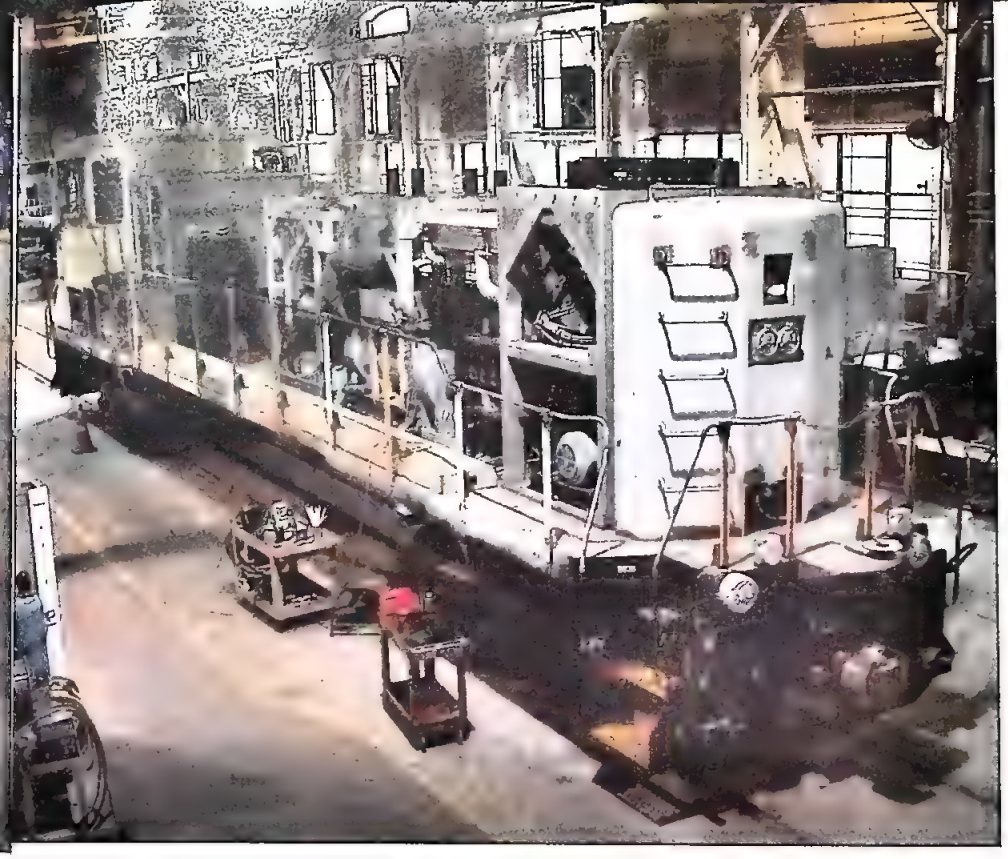
Juniata closed out more than a half-century of locomotive construction in 1946 with 25 less-than-successful T1 4-4-4-4s that proved to be the last desperate gasp for Pennsy steam. When PRR 5524, the last T1, rolled out of the shop in June 1946, there was every reason to believe that Juniata's locomotive building days were finished. Indeed, for 48 years, they were.

And then Conrail re-wrote history. In 1994, Conrail secured a contract for Juniata Locomotive Shops to assemble 45 of 80 SD60Is the road had ordered from EMD. Electro-Motive's order books were bulging, and in the wake of the closure of EMD's La Grange, Ill., facility, the company's tiny London, Ont., plant was overburdened. London's inadequacy was Juniata's gain, and as EMD kits began arriving in Altoona, a new era dawned. Juniata was in the locomotive-building business again — albeit, on a limited basis.

Outshopped in two groups between November 1994 and September 1995, there was little — if anything — to distinguish Conrail 5595-5614 and 5630-5654 from their London-built kin. But, in the grand Pennsy tradition, they're Altoona-built and there's something to be said about that.

In 1998, Juniata won contracts to assemble locomotives for both EMD and GE: 15 Conrail SD70MACs, 24 CR SD70s and 16 BNSF SD70MACs, along with 65 NS Dash 9-40CWs. In anticipation of the looming Conrail break-up, SD-70MACs 4130-4144 were built to CSX specifications, while SD70s 2557-2580

Juniata Locomotive Shop decal adorns GP38-2 5646 painted at Altoona, June 2006.



were constructed to NS specs, right down to their fleet-compatible road numbers. Construction of NS Dash 9-40CWs 9245-9309 and BNSF SD70MACs 9979-9994 began in fall 1998 and, for several months, Juniata had the distinction of simultaneously assembling locomotives for both builders. Work on the BNSF order wrapped up in January 1999; Juniata would be a Norfolk Southern shop by the time the last of the 65 NS GEs were completed in June.

Under the Norfolk Southern flag, Juniata has assembled three more EMD orders: Alaska Railroad SD70MACs 4002-4016 and CIT Financial SD-90MACs, CEFX 126-139, outshopped between December 1999 and March 2000, followed by NS SD70Ms 2581-2590, completed in fall 2001. In recent years, EMD has contracted most of its overflow assembly to Bombardier's facility in Sahagun, Mexico, but Juniata's locomotive building days are far from over.

In Juniata's Wreck Shop, a strange-looking beast shares the floor with a GP40 and three GP38s stripped to the frame for Dash 2 rebuilds. Sitting on shop trucks, the primered, hoodless unit with a distinctive sloped nose and high-browed cab will become NS 101 the second RailPower Technologies RP20BD genset locomotive to be built at Juniata for Norfolk Southern. Although constructed on the frame of retired GP38AC No. 2830, NS 101 is essentially a new locomotive. It will be outfitted with remanufactured trucks and EMD D77/78 traction motors, but everything above the platform is new, including the cab, electrical cabinets, three Deutz RP-500, 4-stroke, V-8, antifreeze-mix cooled engines, rotary-screw air compressor, the dynamic-braking module, and carbody hood sections.

Across the way in the Test Shed, workers put the final touches on NS 100, readying the RP20BD class engine for revenue service. Even as the 100 prepared to move to its debut assignment, negotiations were in progress for Juniata to build more RailPower gensets. By the time No. 100 gets to work at Pittsburgh's Conway Yard, the Altoona shop will have two RP14Ds on the books, two retired SW1500s selected to supply their frames, and hints of even more genset orders to come.

Backshop, builder, rebuilder, contract shop, component remanufacturer, Juniata lives up to its great legacy. The Pennsy men would be proud. Norfolk Southern's Juniata stands as one of the finest locomotive rebuild and repair facilities in the industry, proving that the railroad-owned heavy shop has a place in the 21st century, and putting new meaning behind words cast in iron and bronze on thousands of builders plates: Altoona works. I

Still riding shop trucks, but with two of its three 8-cylinder, 667-hp Deutz/Newage gensets installed, NS 101 (above), the second Juniata-built RP20BD, takes shape in the Wreck Shop. Freshly painted NS 5668 (right) gets decals and lettering in one of the Paint Shop booths, the finishing touch in its extensive rebuild from tired N&W GP38AC 4135 to a better-than-new GP38-2.

RARE BIRDS of the San Joaquin

Diesel Diversity in California's Heartland

Photo essay by Ted Benson

In a land where red-tailed hawks soar with amazing grace, red-nosed hood units like Union Pacific 2677 (above) have become the endangered species. In the decade since the SD40M-3 arrived on the property in glistening Espee scarlet and gray, wide-cab road power has become as common as pigeons at a grain elevator. Yet out of the multiple hundreds of such units roaming Union Pacific steel, a handful of locomotives stand out, a gathering of eagles amid the crows. One of them, SD70ACe 1996, wears the red, orange and black of SP's *Daylight* days. By May 4, 2007, when these images were captured in Fresno, night had long fallen on Southern Pacific's sunset herald. Try telling that to UP 1996, storming north across the art-deco underpass at Belmont Avenue (left), her Portland-bound Z-train recalling the *Starpacer* of yore.

Trading Wings for Wheels

News of Electro-Motive's introduction of the GP7 in 1949 barely rippled the water in the steel tank at Westley, Calif. The steam era on Southern Pacific's West Side line still had seven seasons to run. By the time the spout came off the Westley tank in 1957, *Black Widow* GP9s ruled the roost between Fresno and Tracy.

Three decades later, when EMD rolled out the GP15-1 to compete with capital-rebuild programs at Chicago & North Western and other carriers, Espee was too busy upgrading its own Geeps to consider purchasing new secondary power. It took the 1993 spin-off of the West Side line to regional operator California Northern before EMD's "baby Geeps" with their SP-inspired Tunnel Motor radiator sections found a nest in the Golden State. Smartly dressed in green and cream with silver trucks and yellow trim, the ex-C&NW units colorfully proclaimed that times had indeed changed on the old Espee.

Fourteen years later, tiny Tunnel Motors still roamed the West Side. Little worse for the wear, save the faded heralds beneath their distinctive C&NW nose bells, CFNR's GP15-1s remained on familiar rail regardless of the carrier's acquisition by Rail America in 2002. Framed in the almond blossoms of early March near Vernalis (top right), silhouetted against the Diablo Range at Solyo (bottom right) and bouncing the chant of two 12-645E prime movers off the rusted tank at Westley (left), "Cal Northern" units 105 and 112 continued to bear witness to the wisdom of EMD's designers 31 years removed from LaGrange.

105
CALIFORNIA NORTHERN
105

Hiding in the Shadows

As strange as it seems in 2007, there was a time six decades ago when a 600-hp 70-ton diesel switcher was the biggest unit in General Electric's catalog. By the end of World War II, Electro-Motive was firmly established in the locomotive business thanks in part to the War Production Board. Minority builders like Baldwin and GE would spend the next few years playing catch up with vastly different results. After cornering the niche market for lightweight power, GE successfully made the leap to mainline manufacturing. For steam giant Baldwin, it was the end of the line.

The U-series diesels of the early 1960s were barely a gleam in the eyes of GE designers when Modesto & Empire Traction Co. 70-ton pioneer No. 600 joined the Baldwin-dominated roster in October 1947. Five years later, the arrival of a third new 70-tonner sent the last Baldwin steamers to scrap. Blessed with a growing traffic base and satisfied that the 70-tonners remained "the right engine for the job," M&ET began acquiring good used GEs in 1968. By 2006, when fewer than two-dozen 70-tonners remained in common carrier service in the United States, M&ET's 15-unit roster tallied 10 active units.

Over the past year, two GEs were retired and a pair of EMD SW-1500s acquired, primarily to handle heavy interchange runs over three miles of Union Pacific's Fresno Subdivision through downtown Modesto. The EMDs had yet to answer the call on March 27, 2007 (top left), when M&ET engines 601-600-608-604-603-602 prepared to lift 74 loads of Empire-bound dairy feed off the siding at North Modesto. With 3,600 Cooper-Bessemer horses bearing throaty witness to 333 collective years of service, the six-unit flock of 70-tonners powering engineer Frank Cottle's grain train was a sight to behold.

A frequent Baldwin customer in steam, California's fabled Sierra Railroad remained true to Eddystone when the time came to dieselize in 1955. The builder's days were numbered by then, but the assurance of a future parts supply from Baldwin-Lima-Hamilton sealed the deal for a pair of S12 switchers. Units 40 and 42 moved one apiece via Santa Fe and Southern Pacific to Sierra's new Oakdale shop, where they were joined by a third used S12 in 1966. Four dynamic decades attended the railroad's Baldwin diesel era. By the time Sierra 42's last revenue freight was delivered in 1997, Oakdale's Class I interchange belonged to BNSF and UP.

Spring 2007 saw Baldwin steam power return to Oakdale in the form of McCloud River Railroad 2-8-2 No. 18, on loan to Sierra's excursion operation pending the Mike's eventual move to a new home on Nevada's restored Virginia & Truckee. Fifty years after revenue steam's finale in the San Joaquin Valley, superheated vapor once again rose against the flanks of still-operational Sierra 42 outside the Oakdale shop (bottom left). "Whistling past the graveyard" containing derelict S12s 40 and 44, the 1914-built Eighteen set sail for Warnerville on June 30 (right). For Baldwin fans, it was the best of both worlds.

Forced to Confess

Diesel devotees have long discounted steam fans' assertions that "under the paint, they're all the same." Still, appearances can be deceiving, as the attractive Railink "GP60" working the San Joaquin Valley Railroad's Clovis Local quickly bears out. One of the last locomotives outshopped from LaGrange in August 1992, the BL20-2 assigned to Rail America's SJVR started life in 1955 as Northern Pacific GP9 No. 213. Coupling Dash-2 electronics and a new carbody to a 2,000-hp turbocharged 16-567 prime mover and a rebuilt GP9 undercarriage, LLPX 2122 represents EMD's second attempt to crack the rebuild market — an effort begun by 310 GP15-1s between 1976 and 1982 and continued with a trio of BL20-2 demonstrators 10 years later.

April 27, 2007, saw the 2122 rolling past a Magnetic Flagman on ex-SP trackage in south Fresno (above), destined for a back alley-and-canal bank jaunt along the former Fresno Interurban Railway near Clovis (left). "More is good," a trackside billboard proclaimed, but for EMD's BL20-2, there would never be more than three units. In 2007, all could be found on the SJVR — the rarest of the rare birds in the San Joaquin.

Appearances can also be disappointing, as the two hood units (above) assigned switching chores at the Foster Farms feed mill in Traver will attest. A census-defined flyspeck on California State Highway 99 thirty miles south of Fresno, Traver's grain facility is served by a pair of EMDs whose proud heritage has been sadly betrayed since their delivery to the Atchison, Topeka Santa Fe Railway in the salad years post-World War II. Suffering the least for her affliction is the GP9u — ex-BNSF 1636 whose career began wearing black and silver zebra stripes as Santa Fe 704 in 1956. Remanufactured as AT&SF 2245 in 1980 and renumbered by BNSF in 1998, the 1636 spent nearly 45 years on Santa Fe's Western Lines before its sale to Foster Farms in 2001.

Unit 2631 stopped looking at the mirror in December 1971. Delivered in 1949 as F3A unit 34C wearing Santa Fe's striking "warbonnet" of red, silver, yellow and black, she was a member of the 16 Class that would forever be celebrated as the "Lionel F units." Briefly renumbered 313C following the advent of Amtrak in May 1971, the unit rolled into the Cleburne, Texas, shops later that year to emerge as CF7 2631. Off the roster by 1987, the one-time glamour girl has called Traver home for the past 20 years. Today, the grain dust piles up (right) on the Hyatt roller bearings of a unit whose wheels once rarely stopped turning.

Beauty is Skin Deep

By Sayre C. Kos

Compared with the streamlined "bulldog" face of Es and Fs and the simple yet stylish "Spartan cab" that remained popular on EMD hood units for decades, the SD20 comes across as the homely, clumsier-looking ugly duckling of the Electro-Motive Division brood. The six-axle, 2,000-hp SD20 was never in the EMD catalog, nor was it a La Grange creation. The SD20 was "frankensteined" in the renowned Paducah, Ky., shops of Illinois Central Gulf from non-turbocharged EMD 645 engines, Dash-2 electronics, and the hulks of Southern and Union Pacific SD24s, cabless UP SD24Bs and Baltimore & Ohio SD35s.

Big brothers to the famed hundreds of IC/ICG Paducah Geeps, 42 SD20s were turned out of the Kentucky shop between 1979 and 1982. IC dropped the "Gulf" from its name and adopted a new black livery in 1988. When the SD20s began appearing in this scheme, train crews singled out the black and white engines, branding them with a nickname with an unmerited stigma: They were skunks.

Born different than other locomotives and seemingly ridiculed by the conductors and engineers that ran them, the SD20s started leaving home in the mid-1990s, embarking on new careers with the likes of Indiana Harbor Belt, Chicago & Illinois Midland, and Pacific Harbor Line. A half-dozen found work on Wisconsin-Southern.

Over the course of 25 years in Illinois coal fields, Wisconsin farmland, and California ports, Paducah's ugly duckling has proved to be a valuable 2,000-hp swan. The moral of the tale: Beauty is only as thick as the SD20's sheet metal, but the orchestra of a Nathan P5 horn and the deep chant of WSOR 2051's 16-645 rumbling to lift Chicago-bound grain at Avalon, Wis., can't be beat. I

Sayre C. Kos

Looks are deceiving. Wisconsin-Southern 2051, working Chicago-bound grain with a GP38 at Avalon, Wis., was born as a B-unit. Pushing 50, the aging EMD started life as Union Pacific SD24B No. 416B, received a Spartan cab, and a new lease on life as one of 42 "SD20" rebuilds created by the Paducah, Ky., shops of Illinois Central Gulf between 1979 and 1982.

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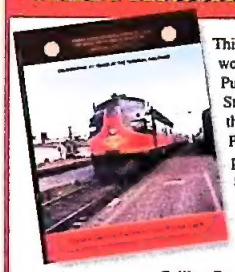

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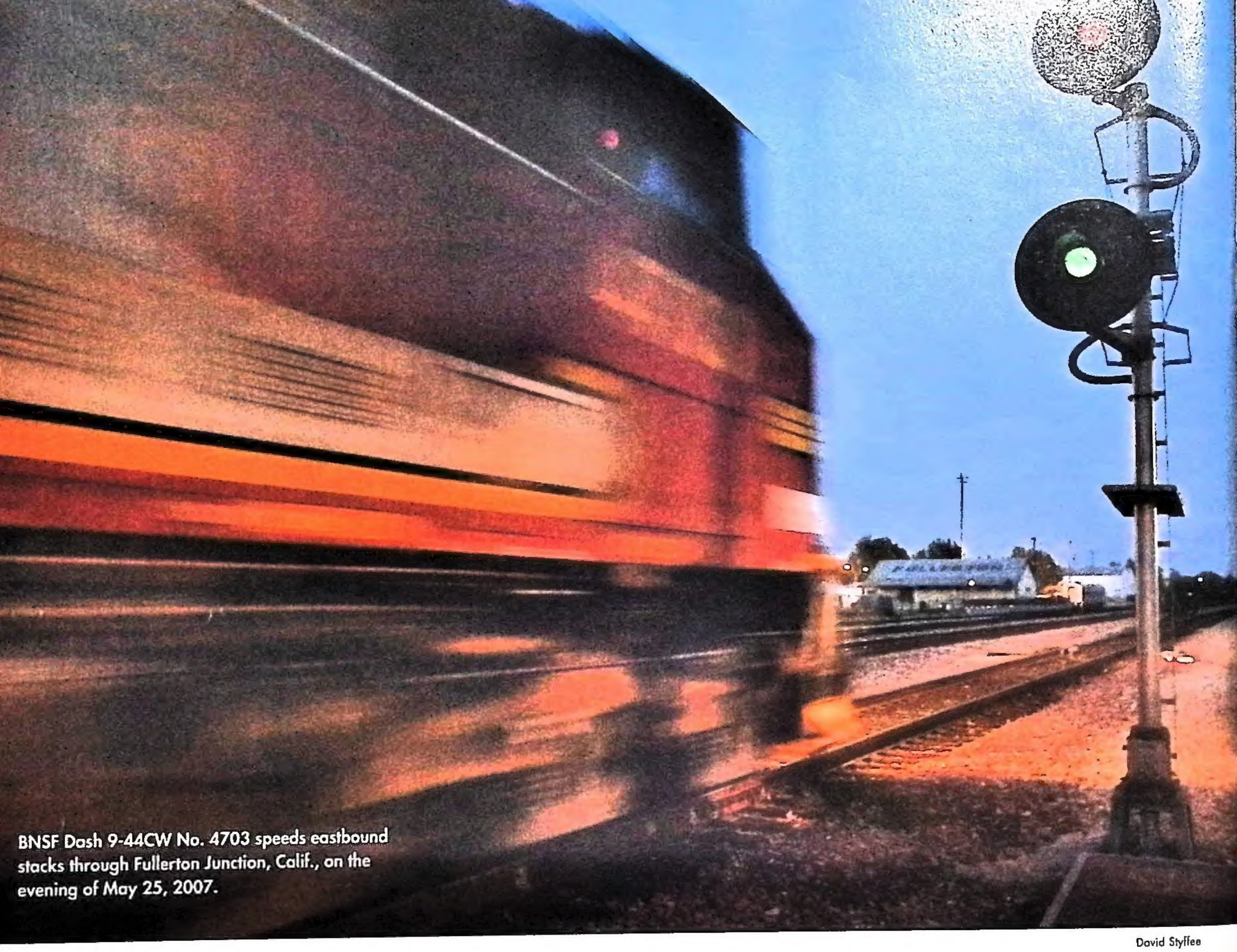

BNSF Dash 9-44CW No. 4703 speeds eastbound stacks through Fullerton Junction, Calif., on the evening of May 25, 2007.

David Styffee

Twilight ... Diverging Clear

By David Styffee

Better photographers — and certainly better writers — than I have celebrated Santa Fe's classic Warbonnet paint scheme, which first appeared on E1A No. 2 in May 1937 with the inauguration of the streamlined Super Chief. It has been the classic graphic of railroading ever since. The colors have graced Electro-Motive's E and F units, FP45s, GP60Ms, and SD75Is. And the dress fit well on models of other builders as well: Alco, Fairbanks-Morse, and General Electric.

In the early 1990s, Santa Fe reached into its rich heritage and created the "Super Fleet," an elite class of locomotives. They were an eventual legion of GP60Ms and GP60Bs, SD75s, and GE Dash 8s and Dash 9s elegantly decorated in red and silver for intermodal service, and operated with the same pride and intensity as the Super Chief and Super C.

The colors represented intense pride at a time when the railroad re-invented intermodal service into a juggernaught of transcontinental trade. Twelve years following the merger with Burlington Northern, the colors still represent that pride — albeit, more often than not as patched, peeling, more-pink-than-red 15-year-old units begging for some fresh orange and black. Worse for wear, perhaps, but nevertheless, a seamless continuation of a 70-year heritage.

Never mind that Dash 9-44CW No. 4703 was delivered after the merger in a hybrid scheme with "BNSF" on its flanks and nose. Her cab is still red, the flanks silver, and the trim yellow and black. Here she is at Fullerton, Calif., eastbound, leading a mile-and-a-half-long string of double-stacks, bearing down on a 50 mph crossover at Fullerton Junction and heading into the night ... Santa Fe style. 1

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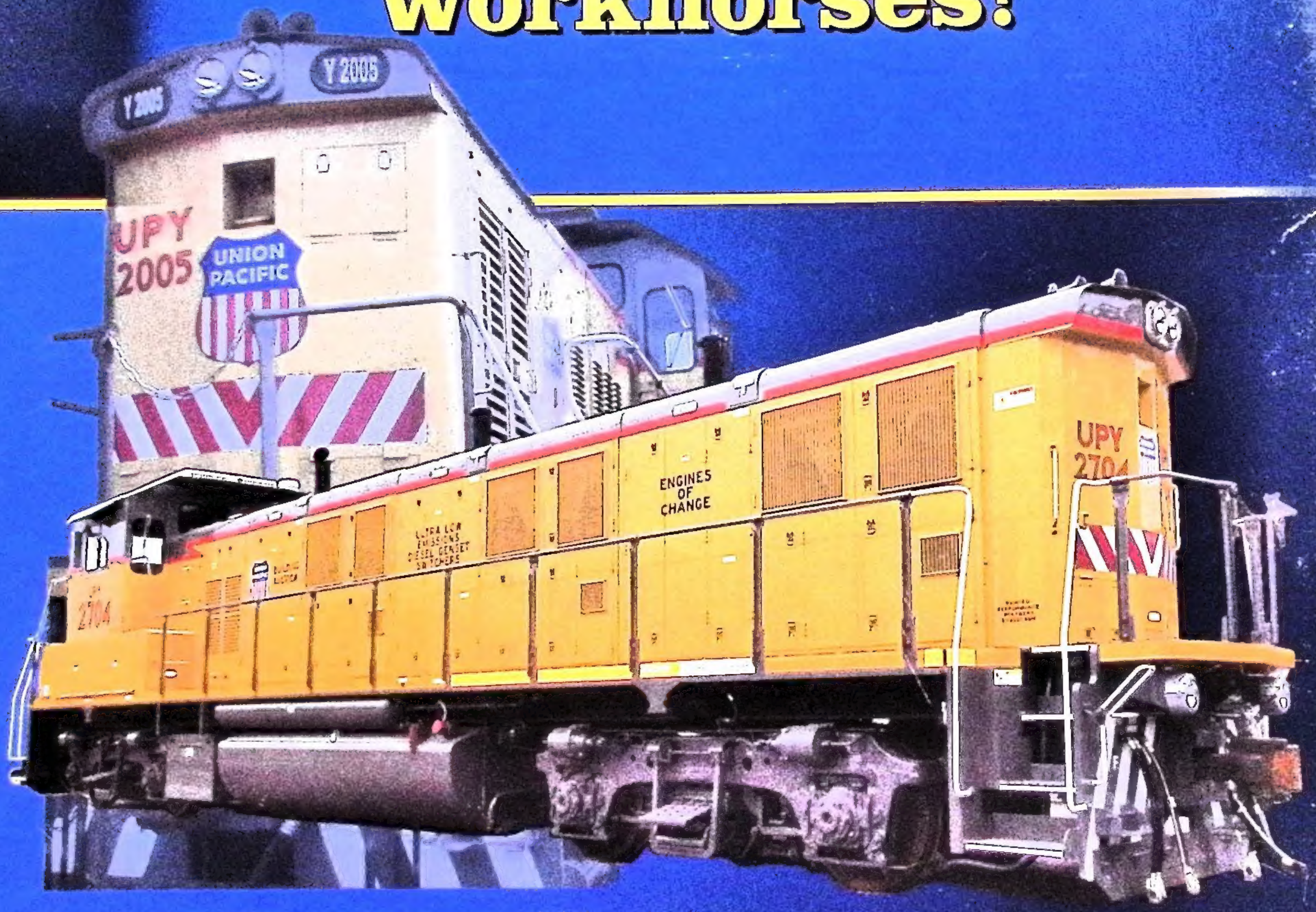

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